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# Public support measures for high-growth SMEs

## A case study


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This thesis identifies and analyzes good practice measures that public policy can employ to support high-growth SMEs (small- and mid-sized enterprises).

The research is based on a case study of support measures for high-growth SMEs that have been employed in 9 countries. The data from each country has been collected by national teams in the Global Entrepreneurship Monitor research consortium. In all, 47 support measures have been identified and reported, of which the 25 most successful are separately described and analyzed in the report.

The thesis finds a number of commonalities between the most successful support measures. These include a high degree of selectivity, flexibility and independence, and an involvement of private-sector actors. Furthermore, this thesis proposes a framework for the categorization of support measures based upon whether the measure acts pre- or post-start-up and whether the measure employs an innovation-, business-, or financing-based perspective. The thesis finds that there seems to be a lack of measures that target the entrepreneurial level of analysis and particularly the motivational component of growth. Finally, the thesis proposes a number of normative recommendations for policy makers for the continued development of public support measures for high-growth SMEs.

This work is part of a study conducted for the Ministry of Trade and Industry in Finland on high-growth entrepreneurship. The research has thus been conducted from a Finnish perspective, however is should nevertheless be relevant for policy makers and researchers also in other economically developed countries.

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# 1 Introduction

## 1.1 Background

Public policy support measures directed at high-growth SMEs (small- and mid-sized enterprises) is a relatively new concept that has emerged as numerous studies have indicated the importance of these firms for job growth and innovation (e.g. Storey 1994; GEM 2005). This report is a part of a study carried out for the Ministry of Trade and Industry in Finland on high-growth entrepreneurship. The report aims to identify and analyze good practice measures that public policy can employ to support high-growth SMEs. This section will serve as an introduction to how public policy in the EU has shifted from focusing on large firms to small firms, with an increasing emphasis on high-growth SMEs.

Western governments, particularly in the European Union, often underscore the importance of small and mid-sized enterprises (SMEs) for economic development and growth (Ström 2001). In the EU, a first action program for SMEs was drafted in 1986, and since then, many public programs and policies have continuously been introduced to support SMEs. For example, the EU recently announced its new Competitiveness and Innovation Programme (CIP), which will support investments by SMEs in 'all forms of innovation and growth' with 2.17 billion EUR between 2007 and 2013.

Nevertheless, the focus on SMEs over the last 20 years represents a shift in policy compared with the approach that western governments took on industry and growth during the larger part of last century (Ström 2001). In the post-war period, it was large firms that were considered the principal drivers of the economy and therefore placed at the heart of industrial and economic policy. The reason why this shift has taken place is that small firms have been recognized as the main drivers of innovation and employment. The idea that entrepreneurial activity is the source of growth, however, is not new. In 1832, French economist Jean-Baptiste Say noted that, when successful, the entrepreneur "shifts economic resources out of an area of lower and into an area of higher productivity and yield." And Schumpeter (1934) famously recognized that new firms are principally responsible for the process of "creative destructions" whereby new

firms replace complacent incumbents by introducing novel goods, services and processes to the market.

There are number of reasons why small firms are having an increased impact in the economy (Rennie 1993). First, smaller firms have internal structures that encourage innovative behavior. For example, an employee in a smaller firm is more likely to be able to capitalize on his innovations and will thus have a greater incentive to innovate compared to the employees in a larger firms whose innovations typically become the properties of their employer, limiting the chance of employees to make individual profit and likewise reducing their incentive to innovate. Second, small firms are typically very effective at seeking out and exploiting new niche markets that are created due to consumers' demand for increasingly customized and specialized products. Third, smaller firms often exhibit less bureaucracy and greater flexibility than do larger firms and can therefore take advantage of opportunities for both process and product innovation that arise as a result of e.g. new technologies and markets more quickly. Finally, improvements in technology increasingly allow firms to cooperate more effectively through firm networks, which in turn reduces the need to operate through the traditionally common vertically integrated organizations in order to be cost-efficient.

However, several recent empirical studies have found that promoting entrepreneurship as such is not likely to be a magic bullet for either innovation or growth. In fact, the most "entrepreneurial" countries in the world - measured by the degree of self-employment - are in the developing world, e.g. Peru and Uganda (GEM 2005). In these countries, becoming an entrepreneur is often an issue of necessity rather than choice.

There are several reasons why "generic entrepreneurship" does not necessarily lead to growth and development. First, most small new firms do not innovate by developing new products or technologies or by conquering new markets. The typical business model for small firms is rather to serve a local market with quite established or even 'old-fashioned' products (Hyvärinen and Rautiainen 2006). For example, in Finland, only about 5-10% of new firms can be considered 'innovative' (Rouvinen and Ylä-Anttila 2004). Second, most new firms tend to grow very slowly if at all, and as a result they will employ very few people. In Finland, the median size of firms three years after start-up was one (Hyvärinen and Rautiainen 2006). In fact, only a minority of firms even want to grow. In a 2004 survey (KTM 2004b), only 7% of firms in Finland wanted to

grow substantially. Furthermore, most new firms, e.g. in the service sector, will not create any of the "high skill jobs" that policy makers often seek to promote.

Multiple empirical studies have confirmed that the distribution of job creation among firms is extremely skewed towards only a few top-performing firms. Thus, among all new firms, only a select few will be responsible for the bulk of all new jobs created. In the United Kingdom, 4% of new start-up survivors were responsible for 50% of jobs created 10 years later (Storey 1994), and in the U.S., 3% of the fastest growing so-called "gazelles" generated over 70% of the new jobs between 1992 and 1996 (Birch 1987). More recently, studies in 'high-expectation entrepreneurship' (GEM 2005) have suggested that a small group of entrepreneurs who have high growth expectations for their firms (defined as intending to employ more than 20 people within 5 years), may be responsible for up to 80% of total job creation by all entrepreneurial activity.

Thus, while the degree of entrepreneurship has no correlation with economic development, *growth willingness* and *actual growth* among small firms is correlated with economic development (GEM 2005). That is, what economies need for economic growth and employment is not merely any new firms and entrepreneurs, but rather new firms that innovate and grow quickly.

Policy makers need to be aware of the job creation potential of high-growth SMEs, and selectively target these firms with dedicated support measures (GEM 2005). As this study will illustrate, the needs of these high-growth SMEs differ from the needs of slower-growing firms, and consequently, the way governments most effectively can support these firms is also different. Given scarce public resources and the skewness of job creation among firms, selectively targeting high-growth SMEs will arguably lead to a more effective policy for growth. However, this is not to say that support for small firms should exclusively go to the potential high-growth SMEs. For example, supporting other small firms has an important role to play in regional and social policy; in some regions and sectors, small SMEs make up 80% of the employment (CEC 2005a).

While support for high-growth SMEs is currently gaining momentum within the sphere of public policy, it is doing so on two separate fronts: within both SME Policy and Innovation Policy. These policy areas have much in common, but have traditionally acted from separate platforms and with somewhat different objectives and philosophies. In order to more effectively support high-growth SMEs, these two policy areas will need to cooperate more comprehensively around common goals for high-growth SMEs. In

this paper, I will refer to this common approach between SME policy and Innovation policy as *"high growth policy"*.

## 1.2 Research problem and objectives

Thus far, surprisingly little research has been done on the characteristics and needs of high-growth SMEs and the implications of these for policy. Even so, several issues that can be considered elements of the broader issue of supporting high-growth SMEs have indeed received considerable treatment, including the financing of these firms and the creation of university spin-offs. However, these studies naturally focus only on a very limited range of measures. Furthermore, while the OECD (OECD 2004; OECD 2005a) and the EU (CEC 2005a; CEC 2005b) have published several catalogs on the range of measures for supporting innovation or SMEs in general, these studies do not typically recognize the specific needs of high-growth SMEs.

The broad goal of this paper is thus to identify and analyze effective measures that policy can employ to support high-growth SMEs in particular. The overarching research question is:

*what are good practice government policy measures for supporting high-growth SMEs?*

While this research question is relatively broad, the specific intended contributions of the study are the following:

1. to identify, describe and analyze support measures that have been implemented to support high-growth SMEs
2. to develop a framework for categorizing support measures for high-growth SMEs
3. to identify good practices and provide normative recommendations for policy makers about how to develop effective policy measures for high-growth SMEs

As this work is part of a study that has been funded by and carried out for the Ministry of Trade and Industry in Finland, the report will mainly take a Finnish perspective and it will have a bias towards Finnish literature sources. Nevertheless, the study should also be relevant more broadly for policy makers and researchers in other economically developed countries.

## 1.3 Methodology

To accomplish the objectives of the study, I have chosen as the principal research method a case study on high-growth support measures that have been employed in a range of countries. More specifically, the data is based on 47 support measures, which

have been identified and reported as relevant to high-growth SMEs, from 9 different countries. The data from each country has been collected through a snowballing method by national teams in the Global Entrepreneurship Monitor research consortium. For detailed case descriptions and analyses, I will focus on the 25 most successful measures of those reported.

The study follows the qualitative research tradition. The research is inevitably exploratory in nature since the field is broad and the research question has not been comprehensively dealt with previously. Although case data is abundant, it is for the most part not suitable for quantitative or more formal analysis, and I have therefore not carried out any strict theory-testing exercise, if indeed such an exercise is ever possible given the multi-layered effects of support measures. Nevertheless, by qualitatively analyzing primary data on policy measures, I hope to develop a broader understanding of the range of policy measures applicable to entrepreneurial firm growth, and develop models and frameworks that can be used to categorize policy measures for high-growth SMEs. Finally, by analyzing successful policy measures from different countries, I hope to generate insights for policy makers on characteristics of good practice support measures.

In terms of relevant theoretical models, I will first provide a literature review on the processes of firm birth, growth and internationalization, with the purpose of providing a better understanding of high-growth SMEs, their founders, and the dynamics of growth. Second, I briefly review the literature on relevant government policies, in order to map typical support measures that are employed within the two policy fields that extensively deal with high-growth SMEs, namely SME policy and Innovation policy. These two literature reviews will provide necessary insights on firm growth behavior and the needs of high-growth SMEs, as well as illustrate typical policy measures for supporting SMEs and Innovation in general.

The methodology has some notable limitations. First, I will focus on concrete support programs and initiatives implemented by governments, defined as measures that have a budget and possibly also a dedicated organization. Therefore, while e.g. pure regulatory and legislative measures have an important role to play in promoting high-growth SMEs, these measures will receive very limited treatment. Second, it is clear that the design of appropriate support measures will depend on the national context; for example, the OECD (2005a) notes that "the benefits of countries' science, technology

and innovation policies cannot be adequately assessed outside the specific context of the national innovation system for which they are designed". Nevertheless, this contextual dimension will also receive very limited treatment in this study. That is, in the scope of this study, policy measures will be identified and analyzed in their own right, with very little consideration of the national context for which they have been designed. Third, support measures do not exist independent from other support measures, and it is therefore important that the portfolio of support measures in a country is coherent and effective. Nevertheless, for the analysis, support measures will be analyzed individually, i.e. with the policy measure as the unit of analysis. Finally, due to the fact that a large part of the material that will be used for this paper consists of policy white papers and research from Finland, a "Finland-bias" is implicit.

## 1.4 Definitions

While most readers probably have a general understanding of the concepts of policy, policy program, entrepreneur, firm, and high growth, these terms are not unambiguous. In this section, I will define these concepts as they will be used in the study.

*Policy.* A policy is a general approach taken by government to address an issue. Typically, policies do not lay out specific action in themselves, but rather outline visions and goals while relying on a group of programs that relate to the policy for implementation.

*Policy program and policy initiative.* A program is a directed action or measure to achieve some goal as defined by the policy. A program typically has a dedicated budget, a defined duration, and may also have a dedicated organization or staff during this period. A policy initiative is similar to a program, but is usually more short-term than a program, and can e.g. be temporary or carried out as a test.

*Entrepreneur*: I will define the entrepreneur broadly as an individual who carries out 'entrepreneurial actions'. These actions can be categorized according to Schumpeter's (1934) classification of *new combinations*: introducing a new good, introducing a new method of production, opening up a new market, finding new sources of supply, or reorganizing an industry. The formal position of the entrepreneur in an organization is not important in this context; the entrepreneur can be the founder/owner, a manager, a patent officer, a mentor, a board member, or any other person undertaking entrepreneurial activities on behalf of an existing or to-be firm. Nevertheless, in most cases in this study, the entrepreneur will be an individual who starts or manages a young

firm. For simplicity of expression and while not subscribing to any sexual bias, I will henceforth use "he", "him" and "his" to refer to the entrepreneur and issues related to him.

*Small- and midsized enterprises (SMEs).* SMEs will be defined in accordance with the current EU definition (CEC 2006b), that is, an enterprise that employs fewer than 250 persons and that has an annual turnover not exceeding 50 MEUR, and/or an annual balance sheet total not exceeding 43 MEUR.

*High growth SMEs.* High-growth SMEs will be defined as SMEs that have a future *potential* to grow over 20% in terms of employment over each of 3 consecutive years, and employ at least 20 people within 5 years. The growth must be primarily organic and thus not driven by mergers and acquisitions. I use employment instead of sales as the main unit of growth, since growth in employment arguably is the primary policy objective. Furthermore, the definition is forward-looking since policy measures today can only affect the future growth of firms. In the definition, I include all firms with a potential to grow, which is a broader definition than firms that have an actual plan or ambition to grow since an integral part of high-growth policy will be to motivate firms that may have a potential to grow but that have not yet recognized this potential or do not have a motivation grow. While no standard definition of what constitutes a high growth SME exists, this definition is in close accordance with other studies on "high-growth firms" or "gazelles" (Birch 1987; Autio, Arenius, and Wallenius 2000; GEM 2005). For simplicity, I will often refer to high growth SMEs as *"high growth firms"*.

## 1.5 Structure of thesis

The paper will follow a structure which broadly corresponds to the objectives as outlined above. In the next chapter (Chapter 2), I will investigate the birth, growth and internationalization processes of the firm. Chapter 3 outlines the approaches taken by SME and Innovation Policy and how these relate to high-growth firms. In Chapter 4, I describe the research methods for the empirical part of the study, and in Chapter 5, I present and analyze the empirical findings. In Chapter 6, I conclude and propose recommendations for policy based on the theoretical and empirical analyses.

# 2 Firm birth, growth, and internationalization

There are many steps on the path from an idea to a successful high-growth company. In order to spur new high-growth firms, ideas and innovations must be translated into business plans, and business plans materialized in the form of new firms. Next, in order to grow, the entrepreneurs of these firms must have a motivation to do so and the firms must have the means and resources to translate this motivation into realized successful growth. Many high-growth firms will also go through a process of internationalization. The internationalization step is most important for firms in niche markets and in small economies where the domestic market is limited. The above process can be illustrated in a number of discrete steps in a "firm growth pipeline" as depicted in Figure 1.


**Figure 1. The firm growth pipeline**

During each step in the pipeline, firms and entrepreneurs face different needs to be met and challenges to be overcome. Thus, in order to improve the "flow" of high-growth firms, one central challenge for policy makers is to identify these needs and challenges and design appropriate policy measures that support firms throughout this process.

In addition to acting on different steps in a firm-growth pipeline, policy can also support the creation and growth of high-growth firms by designing support measures that act on various levels of analysis. These levels include the entrepreneurial/individual level, firm-level, sector-level, and environmental/national level of analysis. However, policy can only promote more or less *static characteristics* within these levels of analysis that support firm growth; I will refer to these as the "structure" for growth. In order for actual growth to happen, these structural factors need to be translated into a strategy for growth, and the growth strategy must be implemented through action; only the

entrepreneur can take these latter *dynamic steps*. Figure 2 provides an illustration of the relationship between the different structural levels, strategy, and action for growth.

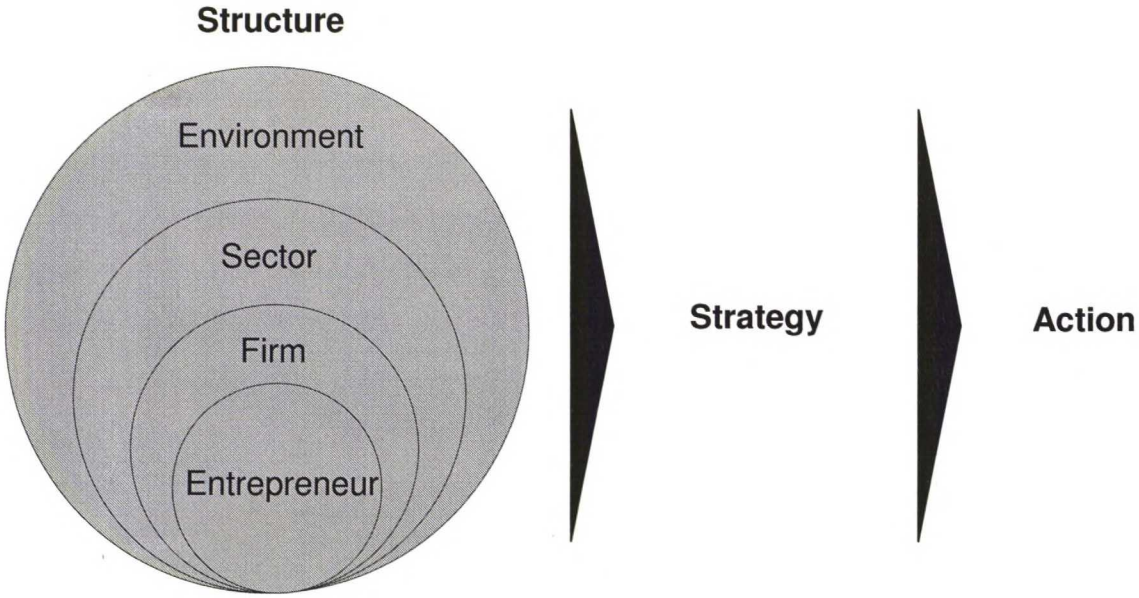


**Figure 2. Structural levels of analysis, strategy, and action for growth**

All of the levels of analysis and their corresponding factors will be treated in more depth in the following sections, but I provide some examples here as they relate to the high-growth firm pipeline.

Starting up a new firm is the decision of one or several entrepreneurs, and so the factors that influence firm birth are principally on the entrepreneurial level of analysis. Growth motivation is the result of individual attitudes and plans, i.e. likewise on the entrepreneurial level, although it is influenced also by e.g. the firm resources and capabilities (firm-level) as well as the market opportunities (sector-level). Growth success will depend chiefly on the firms' resources, capabilities and strategy (firm-level) but also external market factors (sector and environment-level) can create upswings or recessions that can tip the scale for or against the odds of growth success. Internationalization also depends on the same factors that affect growth, but internationalization typically requires yet greater (firm-level) resources and capabilities than does domestic growth. The first step in the pipeline, the link from an idea or an innovation to firm birth is, however, less direct and thus more difficult for policy to isolate and act on. Some of the factors behind innovation are known, such as a high level of education and high-quality research (environment-level); nevertheless, in many countries it has proven difficult to translate increasingly higher levels of education and research into actual new businesses.

Figure 3 provides a more comprehensive illustration of relevant variables for high-growth policy.

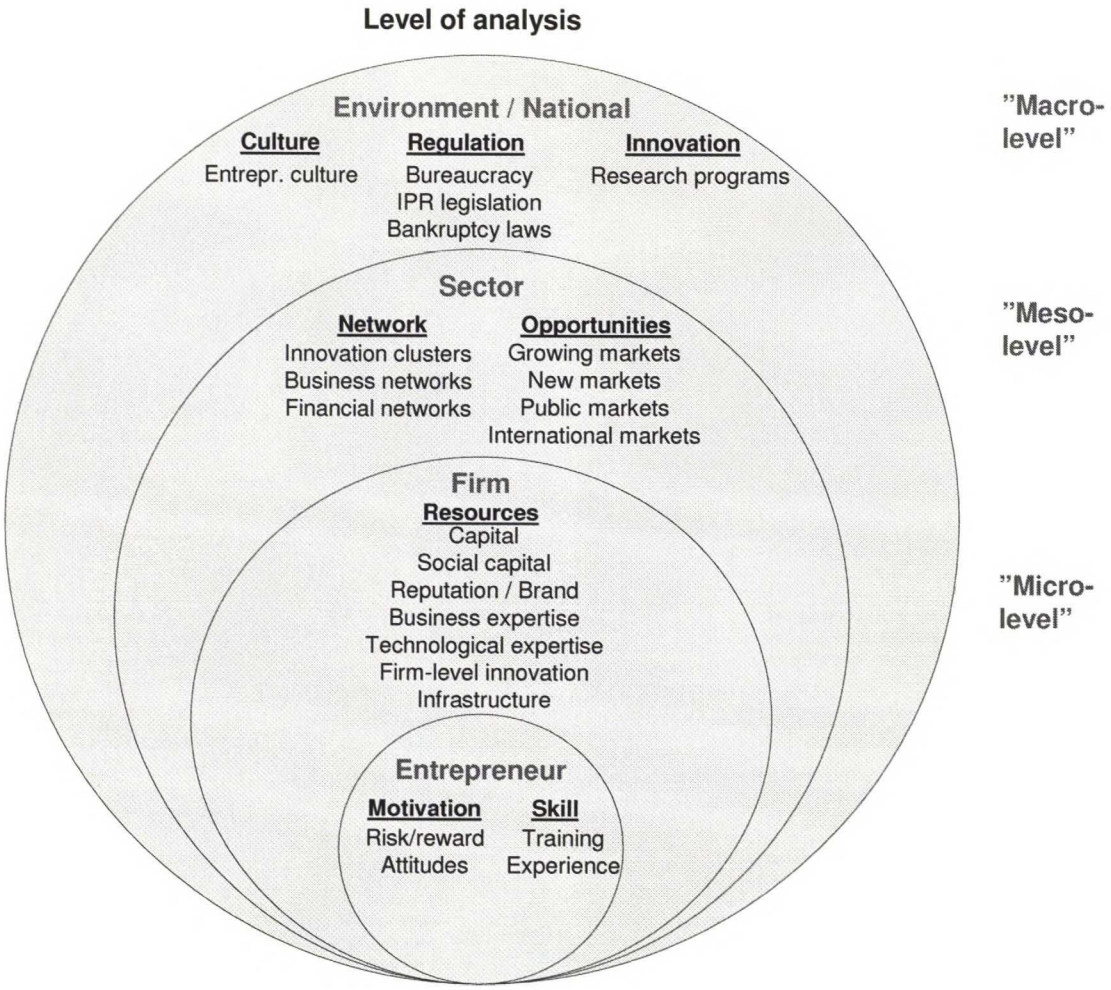


**Figure 3. Levels of analysis in high-growth policy**

This chapter will examine the three processes of firm birth, firm growth and firm internationalization. While the academic literature in this field is vast and a plethora of models exist to represent firm birth, growth and internationalization respectively, I will venture to present an *eclectic* selection of theories and models that I have deemed to be most relevant to the issue at hand, i.e. to provide a theoretical background to designing and implementing support for high-growth SMEs through policy action. Many of the models will be *behavioral* in their tradition, as opposed to e.g. the economists' aggregate view of entrepreneurship. I have chosen this approach since it is arguably through the behavioral perspective that policy can best understand the growth process and design instruments that influence the growth-related actions of the entrepreneur and the firm.

## 2.1 Firm birth

> *"Entrepreneurship is a way of thinking, a way of thinking that emphasizes opportunities over threats" (Krueger et al. 2000)*

One thing that entrepreneurs have in common is their emphasis on opportunities over threats; but thinking about entrepreneurs in terms of a homogenous group may be a fallacy. In fact, entrepreneurs constitute a very heterogeneous group and so do the firms they create.

Researchers often have tried to identify e.g. individual or environmental factors that influence the creation of new firms. For example, studies have pointed to the fact that individuals are more likely to become self-employed if they have family members that are entrepreneurs (Stanworth et al. 1989), they are highly educated (Evans and Leighton 1990), unemployed (Blanchflower and Oswald 1990), or if they have previously worked in a large firm (Keeble et al. 1992), or in a small firm (Cross 1981). Entrepreneurs have also been shown to have a need for achievement (McClelland 1961), be proactive rather than reactive, innovative, easily bored, alert to business opportunities (Chell et al. 1991), avid information gatherers (Kaish and Gilad 1991), and able to successfully identify potentially profitable resource combinations when others do not (Barreto 1989).

However, the fallacy lies in that very few of these findings have had any *predictive* value for evaluating behavior (Krueger et al. 2000). Furthermore, by trying to identify common factors behind entrepreneurs and new ventures, these studies have implicitly suggested that the underlying factors behind various new ventures are similar. When in fact, the issues that are involved in the creation of new ventures are highly diverse and have a high level of interaction. As described by Gartner (1985):

> *The creation of a new venture is a multidimensional phenomenon; each variable describes only a single dimension of the phenomenon and cannot be taken alone… entrepreneurs and their firms vary widely; the actions they take or do not take and the environments they operate in and respond to are equally diverse - and all these elements form complex and unique combinations in the creation of each new venture.*

Furthermore, even if it would be possible to e.g. predict what demographic group may be more prone to become entrepreneurs, this information would still lend little insight into why an individual goes about starting a new business, under what circumstances, and what policy makers can do to influence his behavior.

To make sense of this complexity, several frameworks attempt to model and capture the process of firm birth. In the continuation of this section, I will present two of these, one on the aggregate level, and one on the individual level.

Starting from the aggregate level of analysis, Verheul et al. (2001) describe various demand and supply factors as the macro-drivers of entrepreneurship as depicted in Figure 4. Researchers sometimes refer to the demand and supply side factors and "pull" and "push" factors on entrepreneurship (Storey 1994).

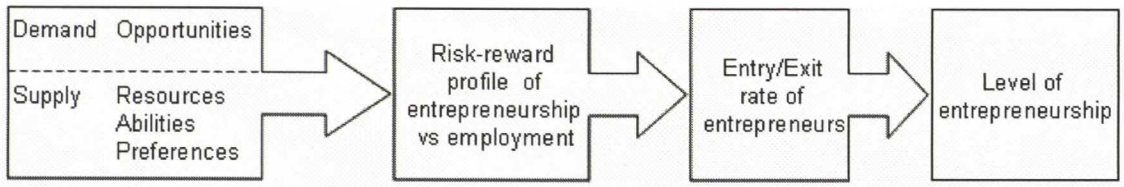


**Figure 4. Determinants of entrepreneurship (adapted from Verheul et al. 2001)**

On the demand side, there can be a pull for new firms due to macro-level changes in industrial structure. This is often an effect of globalization and technological developments, combined with an increasing diversity in customer demand for products and services. On the supply side, push factors such as the availability of external resources (e.g. capital) and the internal abilities and personal preferences of the potential entrepreneur determine whether these individuals will make the choice to become self-employed. In making this assessment, the individuals will weigh the risk and rewards of entrepreneurship against any alternatives, such as waged employment or unemployment. The sum of choices made by individuals of whether to start a new firm or whether to withdraw from self-employment thus determines the aggregate level of entrepreneurship.

On the individual level, Stevenson (1996) has formulated a framework for understanding the factors influencing the entrepreneur's occupational choice. This model consisting of the factors: Motivation, Opportunity, and Skill, as depicted in Figure 5.


**Figure 5. Factors of entrepreneurship (adapted from Stevenson 1996)**

According to Stevenson's model, the entrepreneur will make his decision based on the external market opportunities, the capabilities and resources that he can use to exploit these opportunities (skill), and some cognitive factor which ultimately influences the go vs. no-go behavior of the entrepreneur (motivation).

I have compared these previous two models in Table 1. The comparison reveals that the models are remarkably similar, although Verheul et al. naturally describe e.g. opportunities in aggregate while Stevenson describes one opportunity as recognized by one entrepreneur. Thus, there appears to be some level of consensus in the entrepreneurship literature that these three factors, motivation, skill, and opportunity, are the most relevant when modeling firm birth.

**Table 1. A comparison between Verheul et al.'s (2001) aggregate model and Stevenson's (1996) individual model of firm birth**

| Verheul et al. (2001) | Stevenson (1996) |
|---|---|
| Opportunities | Opportunity |
| Resources and Abilities | Skill |
| Preferences | Motivation |

Of these three factors, I shall argue that the most important single factor for firm birth is the cognitive factor – what Stevenson calls "Motivation" and what Verheul calls "Personal preferences" - i.e. the entrepreneur's intentions whether to start a business or not. I base this conclusion on Ajzen (1991), who also notes that e.g. exogenous situational factors merely affect behavior indirectly, through their effect on perceptions and attitudes that in turn affect intentions.

I will therefore focus my discussion in the following section on intentions. As we shall see, the two other factors modeled by Verheul at al. and Stevenson, opportunity and

skill, can be considered more important for firm growth and survival than they are for firm birth, and these two factors will therefore be described in more detail in the section on firm growth.

### 2.1.1 Intentions of the entrepreneur

Much research has been done in search of situational factors, demographic variables and personal traits that characterize entrepreneurs. However, perhaps not surprisingly, variables such as these have often been found to be poor predictors of the act of actually starting a business. Instead, the main factor that determines whether a person will choose an entrepreneurial career is simply his *intentions* to do so (Krueger et al. 2000). As Krueger et al. succinctly puts it, "we don't start a business as a reflex, do we?"

Starting a new business requires significant time and deliberate planning; and the reason why entrepreneurs go through the process of starting a firm is obviously not primarily because they statistically have a good demographic fit for it, or merely that they would have access to a business idea, or access to the capital necessary for starting a business, but simply because they intend to start a business. This helps to explain why, for example, entrepreneurs often start a firm even *before* they start to scan for business opportunities (Brockhaus and Horwitz 1986).

Having established that it is the entrepreneur's intention which mainly influences his behavior to start a new firm, we can start to look for the factors that in turn influence the entrepreneur's intentions. Krueger et al. (2000) finds empirical proof for just such a model in Shapero's (1982) 'Model of the Entrepreneurial Event', depicted below in Figure 6. Shapero's model describes three factors determining the intention to become an entrepreneur, these are: the individual's general propensity to act; the perceived personal desirability of becoming an entrepreneur; and the perceived personal feasibility to do so.

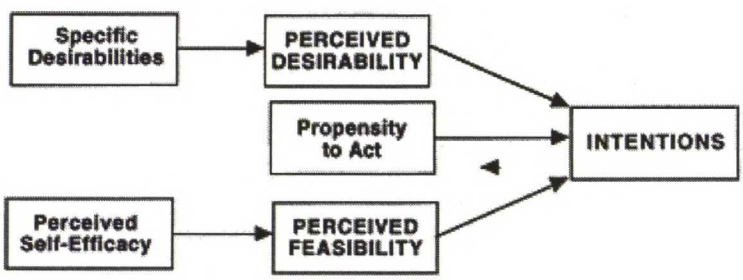


**Figure 6. Shapero-Krueger Model of the Entrepreneurial Event (Krueger et al. 2000)**

The perceived desirability can be defined as the attractiveness of starting a business, which includes both intrapersonal and extrapersonal considerations. This level of attractiveness is in turn based on an assessment taking the entrepreneur's risk-reward profile of entrepreneurship into account. The perceived feasibility is the degree to which the individual feels personally capable of starting a business, which in turn is influenced by his perceived degree of self-efficacy. The propensity to act can be defined as the personal disposition to act on and realize one's decisions. In other words, the entrepreneur's intentions will depend on three attitudes – "I want to do" (desirability), "I can do" (feasibility), and "I will do" (propensity to act).

According to Krueger et al. (2000), an assumption in Shapero's (1982) model is that human behavior is guided by inertia until something interrupts or displaces that inertia – this is called the 'catalyzing event'. The displacement is often negative, such as job loss or divorce, but it can also be positive, such as getting an inheritance or winning the lottery. However, while this 'catalyzing event' may trigger the individual to act on his entrepreneurial intention, it is unlikely to be the source of this intention. Thus, unless the individual has held this intent before the catalyzing event, it is unlikely that any event will trigger entrepreneurial behavior. Therefore, external situational factors tend to affect the *timing* of starting a firm but not as much the actual choice of whether to become an entrepreneur or not.

### 2.1.2 Risk/reward assessment

In making the assessment whether to start a new firm or not, the individual at least implicitly must evaluate the expected risks and rewards of his choice, which in turn will determine the perceived desirability. Since people have different preferences and attach different values to e.g. economic achievements and non-pecuniary benefits (McClelland 1961), the perceived desirability for different people will vary significantly even when faced with similar prospects.

In terms of rewards, multiple studies have shown, however, that the financial rewards of becoming an entrepreneur generally tend to be quite poor. On average, self-employed have lower initial earnings as well as lower earnings growth than employed people. Hamilton (2000) finds that the median earnings differential is 35% to the disadvantage of self-employed; and this difference cannot be explained by e.g. self-selection due to the fact that lower-ability employees may more often choose self-employment. Also

Moskowitz and Vissing-Jorgensen (2002) come to a similar conclusion when they establish that, despite the fact that entrepreneurs bear a high risk and have a low degree of diversification of their assets (entrepreneurs typically have over 70% of their wealth invested in the firm), their return on investment is on average not higher than the return on investments in public equity. According to Hamilton (2000), entrepreneurs make this seemingly irrational economic choice due to the significant non-pecuniary benefits of self-employment, such as "being your own boss", or a perceived autonomy or flexibility in the life as an entrepreneur.

Another reason for choosing an entrepreneurial career may be the skewness in the reward distribution combined with a preference for risk-taking among entrepreneurs. This is sometimes referred to as "superstar theory, and this theory is related with the fact that entrepreneurs tend to overestimate their probability for survival (Moskowitz and Vissing-Jorgensen 2002). For example, Cooper et al. (1988) found that 68 percent of entrepreneurs think that the odds of their business succeeding was higher than for another similar business, while only 5 percent of entrepreneurs think that the odds for their business succeeding was worse. Thus, it is not unlikely that entrepreneurs simply assume that *their* particular firm will not fail, and on the condition that an entrepreneur's business actually survives, the return to the entrepreneur's investment is indeed higher than the return to public equity.

Nevertheless, in many economies, the choice to become an entrepreneur may also be one of necessity. This is typically the case in countries where there are no or very limited benefits for the unemployed and few available opportunities for employment.

### 2.1.3 Barriers to firm birth

Even when people hold positive attitudes towards entrepreneurship, they may still choose not to pursue an entrepreneurial career due to some perceived barriers. A range of such barriers to firm birth have been suggested:

*Bureaucracy and red tape.* Red tape decreases the perceived feasibility of becoming an entrepreneur and also negatively affects the risk/reward assessment. This issue has often been recognized as a potential barrier to the creation of new firms, and several surveys have compared the cost and time to set up a new business in different countries with the implicit assumption that less is better. In general, the cost and time required for setting up a business and the bureaucracy and red tape faced with when running a

business has been decreasing in many countries, which partly may be due to the high visibility this issue has received.

*High opportunity cost.* People may also choose not to pursue an entrepreneurial career due to high opportunity costs in the form of e.g. a well-paying current job or generous unemployment benefits, which reduce the perceived desirability of entrepreneurship. This issue is exacerbated when a potential entrepreneur has high fixed costs and obligations - for example, a mortgage - and cannot risk sacrificing a relatively stable income for the insecurity of becoming an entrepreneur. Furthermore, in some countries, people may immediately lose certain social security benefits if they choose an entrepreneurial career over paid employment or self-employment.

*High risk.* This issue is related to the issue of opportunity costs above in that entrepreneurs will not want to risk their current income for an uncertain future income as an entrepreneur. Furthermore, in the absence of personal bankruptcy laws and since many banks require entrepreneurs to personally stand as guarantors for loans granted for their firms, prudent potential entrepreneurs may be especially reluctant to take on ambitious high-growth projects due to the fear that they may accumulate considerable personal debt in case of business failure.

*Lack of confidence.* Lack of confidence in one's business model corresponds to the absence of the self-efficacy factor in Shapero's (1982) model. Entrepreneurs with low confidence may also generally have a lower propensity to act. Therefore, it is important that potential entrepreneurs are exposed to role models and entrepreneurial success stories. The fact that many entrepreneurs have friends or family members who also are self-employed may be largely due to the fact that these entrepreneurs have had an opportunity to build confidence in their own abilities as entrepreneurs.

*Lack of finance.* Lack of finance is likewise often quoted as a significant barrier to starting a firm. A lack of externally available financing discourages the entrepreneur by decreasing the perceived feasibility of the venture in case the entrepreneur is not independently capable of raising the required funding. This is arguably why the entrepreneur's income and wealth have been shown to affects the creation of new ventures. Although a high income increases the opportunity cost of becoming an entrepreneur, personal wealth may facilitate the financing of the new venture and thus improve the entrepreneur's perceived feasibility.

*No need.* This corresponds to a low level of desirability in Shapero's (1982) model above. People who do not need to become entrepreneurs are unlikely to start a firm even when the potential risk/return ratio is favorable. In addition, since the actual monetary rewards actually on average are negative, having no direct need may essentially eliminate all desirability to become self-employed. Nevertheless, entrepreneurs typically do have a need for achievement which may make them attracted to the skewness of returns that entrepreneurship offers. Entrepreneurs have also been shown to be poor "team players", which in turn may potentially make them less fit for paid employment and thus result in a greater need to become self-employed.

*Stigma of failure.* A stigma of failure is also connected to the issue of lack of confidence above, and may decrease both the propensity to act as well as negatively affect the perceived risk/reward ratio of entrepreneurship. Landier (2005) argues that failure is particularly stigmatized in Europe and Asia, and shows that the level of entrepreneurship is in fact negatively correlated with the stigma of failure across countries, regions and sectors.

### 2.1.4 Birth of high growth firms

A relevant question is whether the birth of high-growth firms somehow is different from that of the average start-up in terms of the underlying individual-, firm-, or sector-level characteristics.

Arguably, new high-growth start-ups and the entrepreneurs behind them, display a higher degree of homogeneity than do start-ups and entrepreneurs overall. Therefore, an analysis of situational characteristics may be more valuable for this group of start-ups than studies on traits of "generic" start-ups and entrepreneurs. In terms of the personal characteristics of the entrepreneur, Roberts (1991) has showed that individual-level psychological factors can explain the creation of 'high-technology ventures'; these ventures are often also assumed to be high-growth. Furthermore, Audretsch (1995) has showed that the creation of such ventures will depend on sector-level issues such as a young and un-concentrated industry structure. Furthermore, Shane (2001) suggests that new technological opportunities may explain the creation of high-growth firms; and he shows that at least three aspects of 'technological opportunity' do seem to affect the creation of such firms, including the importance, the radicalness, and the patent scope of the new technology.

However, while such sector-, technology- and personal-level factors may create opportunities for new innovative firms, new ventures may often face higher entry barriers into these specific sectors since they are often R&D-intensive and thus require much capital. In fact, entrepreneurs have been shown to be less likely to exploit opportunities in R&D intensive industries due to limited funding (Audretsch 1995). Therefore, in these industries, new entrants often must focus on niche customers that large incumbent firms have neglected (Christensen 1997).

Nevertheless, the evidence for any individual, industry-level, technological, or some other situation factor explaining the creation of high-growth start-ups is at best indicative. While we may suggest that entrepreneurs in these sectors e.g. tend to be young and well-educated and that push factors due to e.g. unemployment may play a smaller role in the creation of high-growth start-ups, the principal reason behind every new start-up remains the personal preferences and intentions of the entrepreneur. An entrepreneur with intent will identify an opportunity and the means to exploit it. By the same token, an individual without this entrepreneurial attitude and intent is unlikely to start a firm given even the brightest of prospects and the best of skills.

## 2.2 Firm growth

As already noted in the introductory section, only a small percentage of all new start-ups are responsible for the bulk of all new jobs created by new firms - these are the high-growth firms.

A characteristic of high-growth firms is that they target growth from the beginning of the firm life-cycle. However, most firms and entrepreneurs do not have this ambition to grow. For example, in a 2004 survey in Finland, only 7% of firms reported that they targeted substantial growth (KTM 2004b), and out of the firms that target growth, not all will successfully realize this growth. For example, only 2-3% of all firms internationally can be characterized as high-growth firms (KTM 2004b).

This section will examine the firm growth process, the factors that influence growth motivation as well as growth success, and the barriers to growth that firms face as they move through various growth stages.

### 2.2.1 Growth factors

The factors that influence growth motivation and growth success are similar to the factors that influence firm birth. The entrepreneur must make an assessment of his ability, capability, desirability, and the opportunity to grow when evaluating whether or not to target firm growth; i.e. the same assessment as when making the decision of whether to start a firm. Furthermore, even when the entrepreneur or firm targets growth, actual growth is further impacted by additional factors that influence the successfulness of growth.

As with firm birth, previous studies have suggested a plethora of different factors and models that explain firm growth. For example, Storey (1994) suggests a framework for firm growth consisting of the following factors:

The *characteristics of the entrepreneur*. This includes the entrepreneur's skills, motivation, experience, values, personal traits, and life situation.

The *organizational characteristics* of the firm, including growth need, firm resources, and the market sector.

Firm *strategy*, i.e. how the firm combines its resources and capabilities into a business model.

Storey's model corresponds quite well with the various levels of analysis in high-growth policy that we have previously identified. The entrepreneurial characteristics are simply the motivation and skill on the entrepreneurial level of analysis. The organizational characteristics correspond partly to the resources on the firm-level of analysis. Storey includes the market sector as an organizational characteristic (i.e. on the firm-level of analysis), and what he thus refers to is the firm's choice of market as outlined in the firm's strategy. Firm strategy in Storey's model refers to the combination of resources on the firm-level of analysis. Thus, in order to be successful, firms not only need to possess the sufficient resources and capabilities but also combine and use these resources through an effective business model as defined in the firm strategy (which can be either deliberate or implicit).

Another similar influential model was introduced by Van de Ven et al. (1984), who investigated success factors from three perspectives: the entrepreneurial, the organizational, and the ecological perspective – again, these correspond well to the entrepreneurial, firm- and sector-levels of analysis. Van de Ven et al. also noted that the

most significant factors were found in the entrepreneurial perspective. That is, the entrepreneur's competence (education, experience, internal locos of control), imagination (active risk management, a clear business idea), and commitment (personal investment in the firm) were most strongly associated with start-up success and development of firms.

Nevertheless, as for firm birth, it remains clear that firm growth is intentional. Growth it simply does not "just happen". Davidsson (1991) describes a model for firm growth where growth motivation is the principal driver of actual growth, and where motivation in turn is influenced by the following three *perceived* factors:

*Need*, i.e. that growth serves the entrepreneur's and the firm's goals,

*Opportunity*, i.e. that there are external conditions that can be exploited for growth, and

*Ability*, i.e. that the entrepreneur is able to exploit these conditions in the market.

This model is depicted in Figure 7.

Davidsson's (1991) model is quite similar to Krueger et al's (2000) intentions model, which we examined in the section on firm birth, in that it is the entrepreneur's motivation to grow - a similar concept to the entrepreneurs' intent to start a firm - that ultimately determines whether he will embark on a growth path or not. However, while the entrepreneur's motivation will be influenced by the *perceived* ability, need, and opportunity, it is the *actual* ability, need and opportunity that will affect whether the growth is successful. To illustrate, if the entrepreneur is over-optimistic about his own skills (and thus perceives a higher ability), he will have a higher growth motivation. However, it is the actual and not the perceived ability that together with the entrepreneur's growth motivation will influence actual growth.

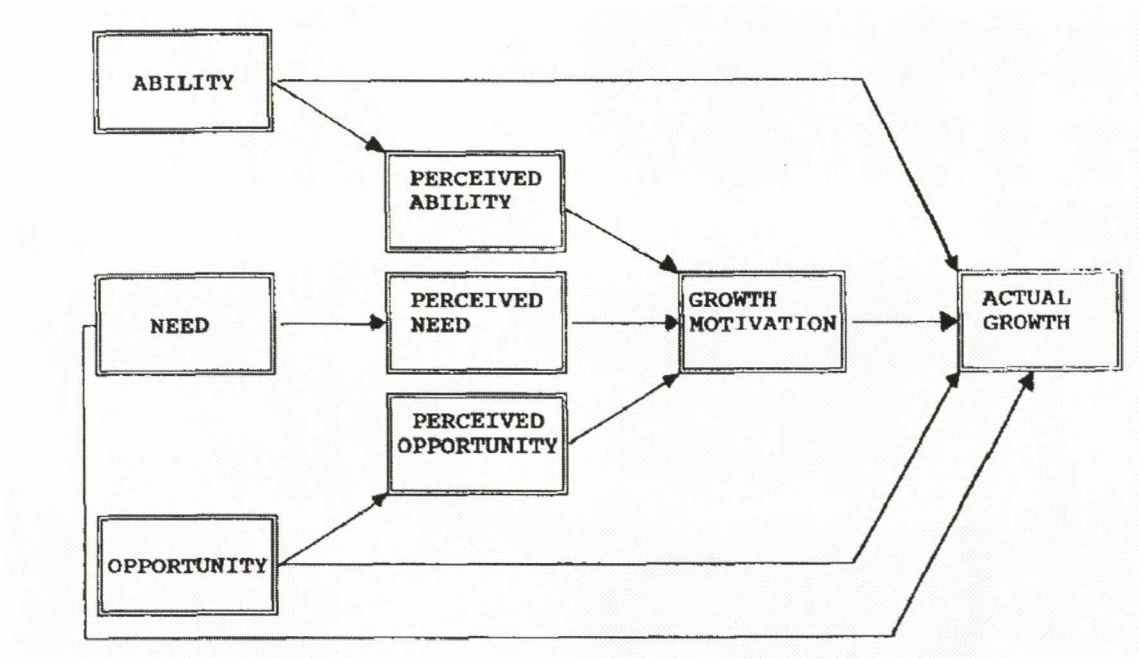


**Figure 7. A model of determinants of small firm growth (Davidsson 1991)**

Davidsson (1991) finds empirical support for his model, and while reality doubtlessly is more complex than the model portrays – for example, there is a higher degree of interaction between the factors (opportunity does not only affect the perceived opportunity but also the perceived need) – the model represents a good synthesis of the various behavioral models for entrepreneurial growth, and will therefore be used for the continued analysis and discussion in this paper.

Next, I will separately discuss each of the factors in Davidsson's model: beginning with ability, followed by discussions on need, opportunity, these three factors as perceived, and finally, growth motivation.

#### 2.2.1.1 Ability

Davidsson (1991) focuses on the individual level of analysis, and thus talks more about the entrepreneur's abilities, rather than e.g. firm resources and capabilities. However, on a more general level, growth ability can be considered to depend on both the entrepreneur's skills, the firm's internal capabilities and resources, as well as the firm's access to external resources (e.g. financing or consulting services).

Important skills for the entrepreneur include training, especially in business, as well as experience from previous entrepreneurial venture. For example, Davidsson (1991) shows that previous business ownership is positively correlated with growth.

Important firm resources include financing, social capital and networks, reputation and brand, business expertise, technological expertise, a capability to innovate, and infrastructure. These resources and capabilities can either be held within the firm or the firm must be able to access them in the market, e.g. by recruiting competent employees or by contracting independent consultants.

Thus, while the abilities of the entrepreneur is important, his skill and experience can be complemented with the skill and experience of the employees or the management team, as well as with the skill and experience of externally accessible resources such as business mentors, business angels, venture capitalists, and consultants.

#### 2.2.1.2 Need

In Davidsson's (1991) empirical investigation among 510 firms in Sweden, need had the strongest effect on growth motivation of all three factors. Davidsson also goes on to suggest that growth satiation, i.e. the absence of need, is the main reason why firms stop growing.

This finding is further supported by the fact that the firm's age (Evans 1987) and the owner-manager's age (Boswell 1972) have both been shown to be negatively correlated with firm growth. When a firm has been in operation for some time, the firm may have reached an optimal size (either objectively or as perceived by the entrepreneur) and the entrepreneur may not need to increase his rents from the firm, or he may attach a lower priority to the continued growth of the firm. In fact, most entrepreneurs/managers feel that the current size of their firms "is optimal" (KTM 2004b), and thus, they do not have a perceived need to grow.

For the firm, its actual/objective optimal size may depend on factors such as capital intensity or regulation. For example, high R&D intensity may require larger companies (this has driven much of the consolidation in the medical industry), while e.g. product liability risks may lead firms to remain small (e.g. every taxi driver in New York has a separate firm) (Kumar et al. 1999). In any case, smaller firms are often more flexible and nimble and may thus be perceived by the owner as easier to manage.

However, while many entrepreneurs claim that the current size of their firm is "optimal", firms in very competitive markets and sectors may nevertheless be required to embark on a growth path in order to attain higher economies of scale and specialization. This is also why external factors such as increased competition in the

market can affect growth motivation and actual growth by inducing a pressing need to attain a larger scale of the business. In addition, personal events in the entrepreneur's life such as higher expenses (e.g. supporting a child) may create a situation where the entrepreneur has a need to grow the revenues and profits of the firm.

#### 2.2.1.3 Opportunity

In contrast to ability and need, opportunities exist in the market and, and opportunities are thus external to the firm and typically outside the entrepreneur's span of control.

Opportunity has been shown to have a relatively lesser impact on growth motivation and actual growth than either need or ability (Davidsson 1991; Van de Ven et al. 1984). For example, firms with high ability tend to do well and grow regardless of whether its market is buoyant or not (Hughes 1998).

Nevertheless, it is clear that some sectors do seem to be more prone for growth than others. In Finland, 71% of growth firms are in the service sectors – mainly the construction, transport, business service, and ICT service sectors.

A number of factors influence the opportunities in specific markets. These factors include: industry structure and dynamics (e.g. the degree of fragmentation); the creation of new markets and niches; market size and growth rate; entry barriers; trade barriers, etc. For example, some sectors such as hair dressers and restaurants have a high natural degree of fragmentation, and while this fragmentation typically reduces entry barriers (and enhances firm births), it may have a negative impact on firm growth. By contrast, firms facing larger markets tend to be larger (Kumar et al. 1999), and when successful, new firms in these sectors will naturally be able to grow faster. The fact that a small market size negatively impacts firm growth thus emphasizes the need for internationalization for firms in small domestic markets.

In addition to sector-level factors, opportunities are also influenced by factors on the national level, such as the economic environment, economic growth and the level of innovation. National-level factors also include demographic and geographical factors such as the population size, age structure, and the degree of consumer sophistication, all of which in turn influence the dynamics of markets and ultimately opportunity.

### 2.2.1.4 Perceived ability, need and opportunity

The actual ability, need and opportunity all directly affect actual growth. But in order to affect also growth motivation, these factors need to be perceived by the entrepreneur. Thus, it is the entrepreneur's subjective perception of his own and his firm's ability, need and opportunity to grow - rather than his ability, need and opportunity in a purely objective sense - that will determine the entrepreneur's motivation to grow and thereby the his behavior.

For example, even though a firm may have a significant growth potential due to some special ability or an opportunity in the market, the entrepreneur may not necessarily perceive this opportunity or recognize his firm's ability, e.g. due to an overly pessimistic attitude. On the other hand, if the entrepreneur is overly optimistic, he may have a significant growth motivation based on his interpretation of the opportunity and his ability to grow; but if his actual ability and the actual opportunity in the market do not also support growth, motivation alone may not be enough for successful growth. In other words, in order to achieve successful growth, it is important that the entrepreneur's perception of his ability and the opportunity somewhat matches the actual opportunity and ability. Even so, a slight over-optimism may actually be beneficial as a boost to motivation.

### 2.2.1.5 Motivation

Small firms are usually intimately tied with and often even indistinguishable from the entrepreneur. In any case, a firm hardly has a will of its own, and the firm will not grow unless the entrepreneur has a motivation to grow his business.

However, there may be several reasons why an entrepreneur may not want to grow the business. Common reasons include a fear of loss of control and independence, a difficulty to combine growth with personal goals, or a lack of business skill. Furthermore, the entrepreneur may not necessarily attach a sufficient desirability to the potential monetary returns of growth to justify an increased effort, but rather prioritize e.g. family, independence, self-actualization through some other means, or work satisfaction over growth (KTM 2004b). Also the entrepreneur's work content, his ability to retain control and independence, the expected effect on personal finances, and the risk of failure are factors that the entrepreneur need to assess.

Even so, it is clear that economic gain is often the most obvious motivator for growth. Provided that a business survives the start-up phase, continued growth often generates significant returns to the entrepreneur. Furthermore, growth can also in the longer run have a favorable effect on the same lifestyle factors listed above as potentially conflicting priorities to growth. As the firm grows, the entrepreneur is usually able to disengage or sell the firm and thus move away from actively managing the firm himself (Churchill and Lewis 1983).

### 2.2.2 Growth stages

In order to explain the growth process of firms, organization theorists have often used the biological analogy of the *life cycle* (e.g. Kimberly and Miles 1980; Hanks and Chandler 1994). Numerous theories have thus been put forth to describe a number of distinct generalizable "growth stages" or phases that firms pass through as they grow.

A common growth-stage pattern for firms includes three stages: start-up, expansion, and consolidation. For firms in the knowledge-, technology- or science-based sectors, the start-up phase is often further divided into two distinct stage: first, a technology development or innovation stage, followed by a commercialization stage, making a total of four stages.

Furthermore, each stage or phase in the life cycle can also be associated with a set of challenges and hurdles that need to be overcome in order to enable continued growth. Hanks and Chandler (1994) synthesized the theories from 8 relevant studies concerning the dominant management problems related with each life-cycle stage, including Dodge and Robbins (1992), Flamholtz (1986), Galbraith (1982), Greiner (1972), Kazanjian (1988), Kazanjian and Drazin (1990), Scott and Bruce (1987), and Smith el al. (1985).

I have compressed Hanks and Chandler's (1994) analysis in Table 2, and in the continuation of this section, I will briefly describe each stage and its associated dominant problems.

**Table 2. Firm life-cycle stages and dominant management problems (based on Hanks and Chandler 1994)**

| Stage | Conception & Development | Commercialization | Expansion | Consolidation |
|---|---|---|---|---|
| **Dominant problems** | • Innovating and developing technology<br>• Transforming idea into a business venture<br>• Identifying and defining market<br>• Building prototype<br>• Developing product<br>• Selling product and business idea to financial backers | • Gearing up marketing<br>• Obtaining customers<br>• Managing cash flow<br>• Fine-tuning and developing products and services<br>• Hiring a capable manager<br>• Formalizing organization and task structure<br>• Scaling up processes efficiently<br>• Gaining support of resource suppliers | • Acquiring resources for managing and financing growth<br>• Developing operating systems for making, selling and distributing product in volume<br>• Avoiding shakeout due to ineffectiveness or inefficiency<br>• Delegation and developing controls<br>• Transferring power from engineering to administration | • Maintaining growth, momentum and market share<br>• Initiating change<br>• Taking advantage of market position<br>• Enhancing productivity<br>• Improving cost controls<br>• Developing management systems<br>• Internal controls |

In the conception and development stage, an immediate challenge is to develop a product or service and define a market. Firms at this stage are typically small and the organization is mainly focused on R&D. Two crucial activities in this stage include proof-of-concept activities and prototyping. Since external financial backing often is needed for the ramp up to commercialization and other subsequent stages, it may be necessary to sell the business idea to venture capitalists or other financiers as a seed-stage investment to ensure sufficient capitalization.

In the commercialization stage, firms face several problems related to the ramp up of the business. The firm must quickly build a customer base and achieve market acceptance, and simultaneously ramp up the production process to match demand while further developing and fine-tuning the product or service. The organization of the firm also calls for more structure and definition, and firms in this stage often will include a separate sales and marketing force. In this stage, it is common for technology-based firms to face a 'leadership crisis' (Greiner 1972) where an experienced manager may be needed to replace the formerly technology-focused management to run the business. Additional external financing is typically needed for this stage.

In the expansion stage, firms will face challenges in amassing resources and capabilities for continued, often very rapid, growth that happens after the firm has achieved acceptance in the market. Securing adequate capacity for manufacturing, sales and distribution, enhancing production efficiencies, as well as maintaining adequate

financing for growth will be among the major priorities. It is equally important to overcome any emergent 'autonomy crisis' (Greiner 1972) through increased delegation, since the management team can no longer control all activities of the expanding firm. New functions typically include customer service, payroll, purchasing, finance, quality control (Hanks and Chandler 1994).

In the consolidation stage, the growth rate of the firm typically slows and focus will shift to making the business profitable through enhanced productivity and cost controls. Productivity can often be increased by addressing and eliminating any inefficiencies in the organization and processes which may have been overlooked during the expansion stage. Firms may also need to overcome a 'control crisis' (Greiner 1972) through increased coordination and more sophisticated internal controls and management systems. In order to maintain continued growth after this step, changes are often required in terms of the firm's product portfolio, choice of market, and processes; and support for restructuring must be amassed in the organization to allow for this growth. However, firms may now generate cash flows internally and are therefore less dependent on external financing.

### 2.2.3 Steady-state stages

Why do firms seize to grow? In an empirical study, Hanks et al. (1993) find two types of steady-state stages where firms have seized to grow. The first type of these firms is what Hanks et al. (1993) call 'life-style firms'. These firms are both very small and mature and have a high degree of centralization; and they are thus examples of firms where owners seem to consciously have kept their firms small. As Davidsson (1989) notes in his study on Swedish SMEs, many small business owners with firms at a size of 5 to 9 employees – a size that approximately corresponds to that of Hanks et al's 'life-style firm' - feel that the negative effects of growth outweigh the potential positive effects. Churchill and Lewis (1983) also suggest that external factors such as a small market niche may explain why firms stop growing.

The second type of firms that have stopped growing in Hanks et al.'s (1993) empirical sample are what McMahon (1998) later refer to as 'capped growth firms'. These firms are typically also very mature but significantly larger than the previous category of life-style firms, with an average size of around 25 employees. The state of these firms is similar to what Churchill and Lewis (1983) have described as the "Success-

Disengagement sub-stage", where a company has survived start-up phase and achieved sufficient size and market penetration to be viable as a running business, and whose owner now chooses to concentrate on other priorities, such as starting a new business, pursuing hobbies, etc, while preserving the firm in status quo instead of using the achieved success as a platform for yet further growth.

Thus, what firms at these steady-state stages mainly seem to lack is growth motivation. Reasons for this lack of motivation may include personal life-style choices as well as a reluctance to surrender control (McMahon 1998). However, the current literature offers few solutions as to how to encourage firms in steady-state to resume growth.

### 2.2.4 Barriers to growth

Other studies have pointed to barriers that can hinder firms from growing. A study by the Ministry of Trade and Industry in Finland (KTM 2004b) pointed to the following barriers to growth: limited demand or fierce competition; risk averseness; limited financial resources; limited growth-related skills; or that the entrepreneur considers the current size to be optimal. Applying these factors to Davidsson's (1991) model above, the last factor, a current optimal size, implies that the entrepreneur considers that he has no need to grow. Lack of financing and growth skills will decrease the perceived ability to grow, while limited demand and fierce competition implies a low perceived opportunity to grow. Finally, risk-averseness may be a sign of a low perceived growth need, where the entrepreneur rather prefers status quo over an uncertain growth venture.

Furthermore, Aldrich and Auster (1986) point to two general disadvantages of start-ups as they want to grow: a liability of smallness and a liability of newness. The liability of smallness means that small have a disadvantage compared to larger firms in terms of efficiently raising capital, complying with regulation, and employing specialty staff. The liability of newness means that new firms face challenges in establishing their credibility in the marketplace and thus attract employees, customers, and suppliers who may fear that the new venture will fail. This liability is thus particularly severe for high-risk ventures.

Firms in high-R&D sectors may also consider the risk of expropriation as a cap for the growth rate. Especially in industries where the critical resource of the firm is easy to replicate and where employees have low job switching costs, owners may want to limit

the rate of employee growth in order to prevent a situation where former employees may set up a competing business (Kumar et al. 1999).

## 2.3 Internationalization

Internationalization can broadly be defined as a process of a firm's increasing involvement in international operations (Welch and Luostarinen 1988). While international activities traditionally have been mainly the domain of large companies, international expansion is an increasingly common vehicle for growth also for small- and midsized companies. As a result, several policy measures have been designed to aid these companies in their internationalization process.

Internationalization is especially important for firms with innovative products and services in small economies where the domestic market is limited. Nevertheless, as the previous sections have illustrated, most small firms do not want to grow, and likewise, the majority of small firms neither have a motivation to internationalize. As Acs et al. (1997) put it: "small firms tend to be homebodies".

This section will look into the international processes of firms and the constraints that internationalizing firms face. The section will start with an examination of the '*traditional*' view of gradual internationalization, followed by a discussion on the rapid internationalization processes used by so called 'born globals'. *Born globals* constitute a quite recent breed of firms that internationalize very quickly after start-up, and the internationalization processes of these firms thus differ from those of traditional domestic-based companies.

### 2.3.1 The traditional model of internationalization

The most commonly referred to model of internationalization is the so-called 'Uppsala model', first described by Johanson and Wiedersheim-Paul (1975). According to this model, there are two types of choices that internationalizing firms need to make; these choice concern 1) the entry mode, and 2) the market. These choices are pictured in Figure 8, and will be discussed in separate sections below.

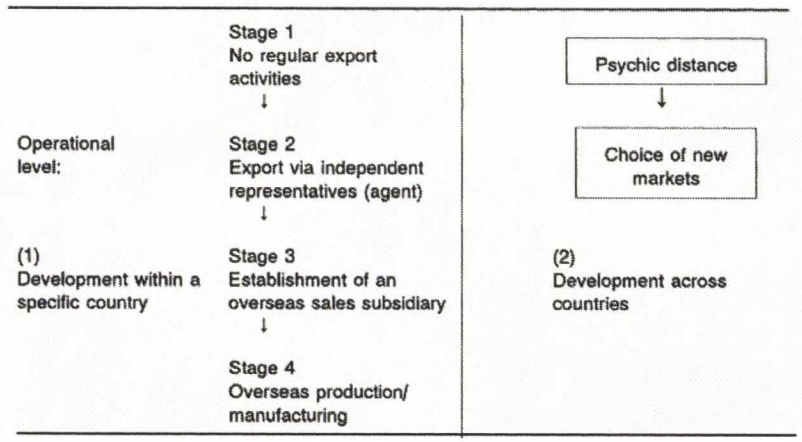


**Figure 8. The theoretical and operational dimensions of the Uppsala model on firm internationalization (from Andersen 1993)**

### 2.3.1.1 Entry mode

In terms of entry mode, Johanson and Wiedersheim-Paul (1975) found that firms tend to follow a step-wise approach to internationalization within each foreign market, which consists of the following four steps:

1. No regular exports,
2. Exports via agents,
3. Establishment of a sales subsidiary, and
4. Production in the foreign market.

This sequence of an evolutionary and incremental process is called the 'establishment chain', where each link in the chain represents a larger commitment of resources to the new market. This gradual pattern can be explained by two underlying reasons: a lack of knowledge about the foreign market, and uncertainty associated with the decision to internationalize.

Another reason why firms may choose to internationalize following a gradual pattern is that the process is expensive. Internationalizing firms face high costs and challenges related to establishing sales channels, obtaining market information, as well as for providing customer service in other languages and on different continents. Thus, firms tend to expand slowly in order to enable incremental learning and to mitigate risks associated with the internationalization process (Ghauri 2000). Due to the high costs, a firm would typically be able to enter international markets only after the firm has already established itself in the home market and thus can afford an expansion outside its domestic borders.

The choice to enter international markets is typically a consequence of a series of several incremental decisions to expand (Ghauri 2000). A common trigger to start exporting

consist of unsolicited requests from foreigners to sell products overseas (Bilkey and Tesar 1977), and internationalization is often in that sense more opportunistic than part of a deliberate strategy. That is, unlike firm birth and firm growth which are typically the result of intentional strategic choices, the typical internationalization process in this traditional view seems to be one of small, often opportunistic steps that lead a firm to increasingly export more and later also base some operations abroad.

Since the model was constructed, intermediary or hybrid approaches to internationalization such as joint ventures, franchising, licensing, etc, have also become increasingly popular modes of internationalization; these approaches would fit in between the four modes listed above. Yet another approach to internationalization that is becoming increasingly common is to internationalize through networks. This approach means that firms internationalize as a consequence of other firms in their network (e.g. their main customer) internationalizing. The network mode is especially common for small firms who are subcontractors to large international firms, and these firms' networks will affect both their choice of market as well as entry mode. For these firms, internationalization through networks can be highly effective; e.g. Acs et al. (1997) argue that small firms' innovations may be diffused globally more efficiently when they are channeled through existing multinationals.

#### 2.3.1.2 Choice of market

In terms of the choice of market(s) - according to the traditional view - firms will tend to first expand to foreign markets that are better known, e.g. in terms of customer preferences and business practices in the foreign market. These markets are typically close in either physical or cultural distance (Kogut and Singh 1988). For example, according to the traditional view, Finnish firms that expand internationally would first tend to expand to e.g. Russia (close physical distance), Germany (close cultural distance), or Sweden (close physical and cultural distance). As firms continue their international expansion, they sequentially move to countries that are increasingly farther away.

The Uppsala school introduces the concept of 'psychic distance' to describe the firm's proximity to a foreign market. Psychic distance can be defined in terms of factors that prevent or disturb the flow of information between the firm and the foreign market. These factors include differences in language, culture, political systems, level of education, and level of industrial development (Johanson and Vahlne 1977).

### 2.3.1.3 Barriers to internationalization

Firms going through the internationalization process face many challenges related to their establishment in foreign markets. These barriers may be especially difficult to overcome for small firms, and internationalization processes of small firms have also been shown to be more prone to failure than those of large firms (Newbould et al. 1978). Typical challenges include:

*Lack of knowledge* about the foreign market. As we noted in the previous section, market knowledge is one of the main reasons why firms choose to internationalize sequentially, starting from the most psychically proximate countries. Internationalizing small firms e.g. need to overcome challenges in terms of understanding the foreign market and how it is different from the domestic one (Ghauri 2000). There may often be differences in customer preferences, legal systems, cultures, languages, and national market conditions, and small firms do not typically have this knowledge in-house.

*Lack of resources.* Firms may need plenty of resources to overcome the barriers to entry to international markets. In addition to the lack of knowledge already mentioned above, barriers to entry can include issues such as financial market imperfections, entry barriers that are erected by entrenched firms (e.g. through collusion and by building up war chests for predatory pricing), and entry barriers erected by governments (e.g. through regulations, restrictions, safety and environmental standards, etc) (Acs et al. 1997). Small firms in particular may not have the resources required to afford delays that the internationalization process may encounter due to these barriers (Acs et al. 1997).

*Protection of property rights.* Small firms, especially in technology-based sectors, also need protection of their property rights such as patents and trademarks in order to be able to profit from their innovations internationally. Nevertheless, property rights may be more difficult to enforce in international markets, and small firms typically have a less power, clout and resources to protect their rights globally than do large firms.

*Cultural shift.* Firms also need to manage the cultural shift that is required to move from a domestic to an international perspective. In many firms, internationalization may also be met with skepticism or even resistance; especially if the process involves establishing some operations abroad. Therefore, a strong perseverance and determination is required for any small firm that wants to internationalize (Rennie 1993).

## 2.3.2 The born global

The concept born global firm was first introduced by Rennie (1993). In a study by McKinsey & Company, Rennie found that some Australian firms established themselves successfully in international markets without first building a base in the firms' domestic market. A 'born global' thus came to connote firm that follows a global business model from inception, and does not enter international markets slowly or merely as a complement to the domestic market. While large domestic-based firms still typically follow a gradual step-wise process to internationalization, e.g. Coviello and Munro (1995) found that the internationalization process of small high-technology firms in particular did not fit the traditional model.

Like the pet child that has many names, born global firms have also been called 'born internationals', 'instant internationals' (Preece et al. 1999), or 'international new ventures' (Wilson 2000). Nevertheless, the concept of the born global has become the most established term for these firms within the entrepreneurship research literature (Knight and Cavusgil 1996; Madsen and Servais 1997), although the term is most often used in the Nordic countries. Nevertheless, the Nordic countries are characterized by small but open domestic markets - traits that characterize a natural breeding ground for born globals (Luostarinen and Gabrielsson 2004) - and it is therefore not surprising that much of the discussion around born globals is carried out in these countries.

### 2.3.2.1 Characteristics, entry mode, and choice of market

Born globals represent a new phenomenon in the anatomy of firms, and their business model has been made possible due to two trends: technological advancements and globalization (Knight and Cavusgil 2004). Technological advancements have decreased the previously high costs of managing operations, marketing and sales on a global scale, thus enabling small firms to simultaneously enter multiple international markets. Rennie (1993) observed that a key tool in enabling small firms to operate globally in the beginning of the 1990's was the use of the fax machine; today, email and electronic commerce is further shrinking the world and opening up opportunities for small firms to operate globally.

Although customer demands are becoming more specialized, there is also a trend towards global convergence of customers' tastes (Levitt 1983), which is creating a more homogenous global market in certain products and services, and thus reducing the need

for firms to tailor products to each national market. Technological advancements and globalization have together also reduced the 'psychic distance' between markets, further enabling the rapid expansion of firms.

Born global firms have a significant potential to account for a large share of an economy's export growth through SMEs. Nevertheless, the internationalization processes and strategies that born globals utilize differ significantly from those of traditional domestic-based companies (Luostarinen and Gabrielsson 2004) and cannot be explained by standard theories of internationalization (McDougall et al. 1994). Bell et al. (2003) offer a comprehensive comparison of the characteristics of 'traditional' vs. 'born global' firms, which is presented in Table 3. While a discussion around all of these characteristics would be excessive for the purpose of this study, I will briefly examine a selection of these issues below.

**Table 3. Characteristics of 'traditional' internationalization vs. 'born globals' (Bell et al. 2003)**

| | 'Traditional' | 'Born global' |
|---|---|---|
| **Motivation** | • Reactive<br>• Adverse home market<br>• Unsolicited orders/enquiries<br>• Cost of new production processes force export initiation | • Proactive<br>• Global 'niche' market<br>• International from inception<br>• Active search |
| **Objectives** | • Firm survival/growth<br>• Increasing sales volume<br>• Gaining market share<br>• Extending product life-cycle | • Competitive advantage<br>• 'First-mover' advantage<br>• 'Locking in' customers<br>• Rapid penetration of global niches or segments<br>• Protecting and exploiting proprietary knowledge |
| **Expansion patterns** | • Incremental<br>• Domestic expansion first<br>• Focus on 'psychically proximate' markets<br>• 'Low-tech'/less sophisticated markets targeted<br>• Limited evidence of networks | • Concurrent<br>• Near-simultaneous domestic and international expansion<br>• Focus on 'lead' markets<br>• Some evidence of client 'followership'<br>• Strong evidence of networks |
| **Pace** | • Gradual/slow<br>• Small number of markets<br>• Single market at a time<br>• Adaptation of existing offering | • Rapid<br>• Large number of markets<br>• Many markets at one time<br>• Global product development |
| **Methods of distribution/entry modes** | • Conventional<br>• Use of agents/distributors or wholesalers<br>• Direct to customers | • Flexible and through networks<br>• Use of agents or distributors<br>• Also evidence of integration with client channels, use of licensing, joint ventures, overseas production |
| **International strategies** | • Ad-hoc and opportunistic<br>• Evidence of continued reactive behavior to new opportunities<br>• Atomistic expansion, unrelated new customers/markets | • Structured<br>• Evidence of planned approach to international expansion<br>• Expansion of global networks |
| **Financing** | • 'Boot-strap' into new markets | • Venture capital<br>• Initial public offerings |

In terms of entry mode and process, the born global enter foreign market *quickly* and as a result of *deliberate planning.*

Born globals enter international markets soon after entering the domestic market, simultaneously with the domestic market, or even before entering the domestic market. For example, Bell (1995) describes the phenomenon of software companies that first enter foreign markets and only later establish themselves in the domestic market. Furthermore, the born global, contrary to the traditional internationalizing firm, often establishes itself in several foreign markets simultaneously. By moving rapidly to introduce their innovations in key markets, born globals seek to obtain a first-mover advantage in these markets.

Furthermore, born globals tend to adopt a more structured approach to internationalization based on an active search, in contrast to the opportunistic, ad-hoc approach of 'traditional' companies. Careful planning is important because entering several foreign markets rapidly limits the opportunity for learning and gathering experience in a smaller, more sheltered market. Instead of proceeding slowly through the typical 4 stages of internationalization as depicted in Figure 8, born globals often jump stages; and they also commonly use networks and hybrid modes of internationalization (such as joint ventures, licensing, etc).

In terms of the choice of market, born globals seek out international niche markets where they successfully can satisfy highly specialized customer needs with limited competition from incumbent firms. Born globals can be found in all sectors, even in industries that are considered to be declining (Rennie 1993). However, as their competitive advantage is typically knowledge-based (McKinsey & Company 1993), born globals are usually concentrated in the following five sectors: high-tech, high-system, high service, high know-how, and high design (Luostarinen and Gabrielsson 2004).

Instead of focusing expansion to psychically close markets, born globals will focus on lead markets *(*Alahuhta 1990), and thus prioritize potential new markets primarily based on customer potential rather than psychic proximity. If the born global already has important domestic customers, it tends to follow its domestic customers to international markets without regard to the proximity of these markets (Bell 1995).

The born global does also differs from the traditional domestic-based firm in that it is more open-minded about where to base its operations. While the founders may be of a specific nationality they will often consider basing their company close to their customers or wherever these firms may so obtain a competitive advantage, be it due to skilled labor, low cost, or any other combination of factors. The base country for the

born global may or may not be the 'home country' of the firm, if the concept of a home country indeed even is relevant to these firms. In fact, born globals often have R&D, manufacturing, and administrative functions on separate continents (Bell et al. 2003).

Finally, born global firms are very young, and the entrepreneurs in these firms are typically also very young and thus relatively inexperienced. In one Finnish case that Luostarinen and Gabrielsson (2004) examined, the average age among the 35 employees was 25. Since the management of a born global may require bolder and less incremental action that that of the traditional internationalization firm, the role of the entrepreneur is perhaps even more important to the born global than that of the entrepreneur in the traditional firm. In fact, it is often the unique competences and personal network of the entrepreneur that give rise to the opportunity of the born global to rapidly expand globally (McDougall et al. 1994).

#### 2.3.2.2 Challenges for born globals

The hurdles faced by born globals through their internationalization process are very similar to the hurdles faced by traditional internationalizing firms; i.e. lack of knowledge, limited resources, difficulties in protecting property rights, and challenges of cultural change. More specifically, Rennie (1993) outlines a typical timeline for born global and identifies associated constraints that born globals face as they grow. Rennie's model is depicted in Figure 9.

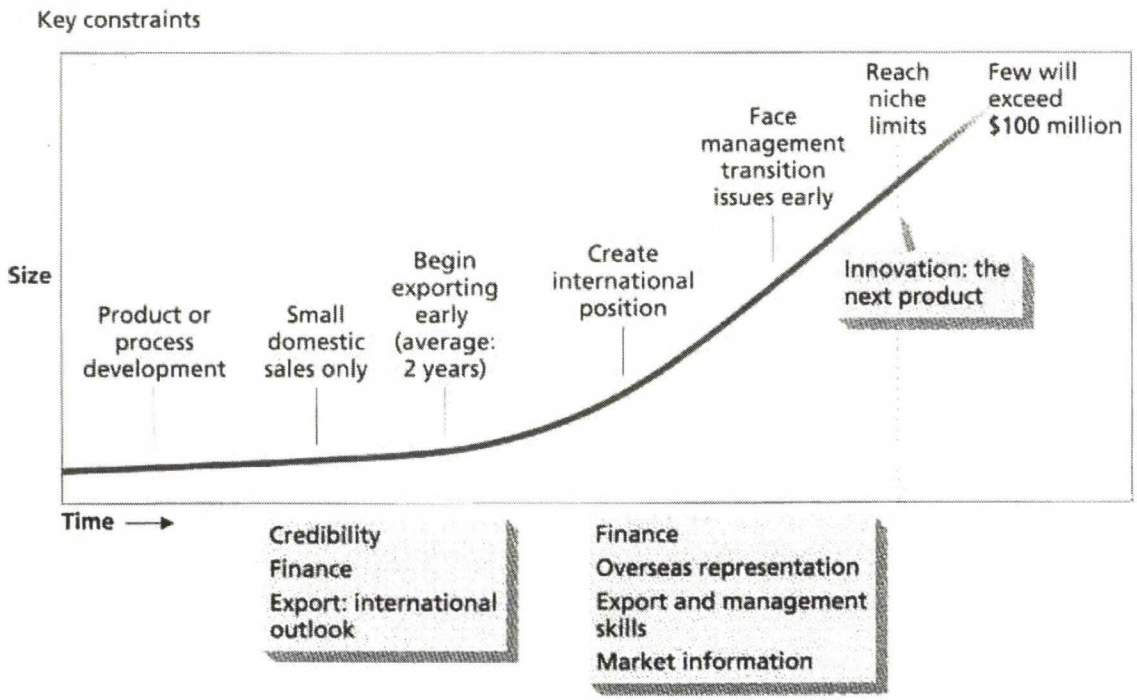


**Figure 9. The born global firm's profile (Rennie 1993)**

The first challenges that born globals face even before starting their internationalization process include the issues of credibility, finance, and international outlook. In order to build credibility, born globals may often benefit from piggy-backing on established network partners. In terms of finance, while traditional companies often use internally generated funds to finance international expansion, born globals will need considerable external funding, often in terms of VC, to finance rapid growth. Finally, the speed and deliberateness with which born globals enter international markets require an early international outlook in terms of a clear internationalization strategy and a global vision for the firm.

Later on, when building the international market position, additional challenges include management of sales channels, obtaining more detailed market information, and expanding the product range. The challenges in managing the rapidly expanding firm will often require a relatively early management transition by which the typically young founding entrepreneurs are replaced or complemented with more experienced managers. Finally, while the initial strategy of the firm typically is to focus on small niches, the continued growth of the firm may require an expansion of the product range and in so doing, the firm will face fiercer competition with incumbents in the new market segments.

### 2.3.2.3 Success factors

While the trends of globalization and technological advancements have enabled born globals to operate as new breed of firms, only very few young firms with an international vision and intent are able to translate this intent into successful international growth. Thus, we need to look at the capabilities and resources of these firms in order to identify the success factors of born globals (Knight and Cavusgil 2004). A number of these success factors are presented below:

*Innovation.* A culture characterized by innovation is a prerequisite for successful rapid internationalization (Knight and Cavusgil 2004). In order to expand globally, the firm will need also need a capability to turn innovation into commercial products and services for a global market. Nevertheless, internationalization can also be a driver for continued innovation as the firm is exposed to new cultures, tastes, customers, suppliers, and business practices.

*Managerial attitudes.* In order to be able to expand rapidly to international markets it is important that the firm has an international vision from inception, and this vision must come from a determined management attitude to target global markets. If this attitude is not present from the beginning, the path-dependent nature of business decisions may make it difficult to develop international capabilities at a later date (McDougall et al. 1994; Preece et al. 1999).

*Managerial expertise.* Born globals require competent leaders with international experience. While born globals typically have necessary technical expertise to succeed in the marketplace, their managers may have very limited experience and may therefore need external assistance. As noted by Rennie in Figure 9 above, born globals will in fact often go through a change of management very early after entering international markets. Nevertheless, given the often inherent uncertainty in their business, these firms may face a challenging in recruiting experienced management. This is also why the support of VC funds may often be needed to attract and channel experienced managers.

*Speed to market.* Speed to market is critical for born globals in order to build credibility early, tie up lead customers, and get a head start in lead markets. For example, penetration pricing may be required in order to attract customers early (Luostarinen and Gabrielsson 2004).

*Financial resources.* In order to enable the strategy of moving quickly into several international markets, it is not typically sufficient to finance the expansion with merely internally generated revenue. Again, given high uncertainty of the prospects and high failure rates, also loan funding will be difficult to attain. Therefore, a significant amount of venture capital is likely to be needed in order to support the growth strategy of born globals.

*Networks.* As have seen in the previous section, born globals often use networks and strategic alliances and thus rely more heavily on network partners for growth than do 'traditional' internationalizing firms (Bell et al. 2003; Luostarinen and Gabrielsson 2004). These networks and hybrid structures can be used to compensate for the resource scarcity that characterize young firms (McDougall et al. 1994), and networks are thus especially important in the case when a firm cannot raise sufficient venture capital for single-handed expansion.

*Brand and IP.* Finally, the development of a strong global brand in its niche may also be required for success in order to capitalize on the firm's innovation and reduce the risk of imitation (Luostarinen and Gabrielsson 2004).

# 3 SME policy and Innovation policy

High-growth policy exists in the intersection between two policy areas: Innovation policy and SME policy. These two policy areas have the same ultimate goal, i.e. employment and growth, but they use somewhat different types of measures to contribute towards this goal.

This section will examine the goals of Innovation policy and SME policy and the typical measure types employed by these policies, with the purpose of outlining the scope of each of these policy areas. Further, I will briefly examine how these policy areas complement and differ from each other. Thus, this section will outline the greater "playing field" where high-growth policy acts, and thus serve as a map for the empirical investigation on high-growth policy measures to follow.

## 3.1 Market failure and market intervention approaches

Before we closer examine the various types of support measures employed by SME policy and Innovation policy, it is useful to recognize the rationale behind public policy intervention, i.e. the concept of market failure. Broadly speaking, market failure happens when the voluntary market exchange on its own does not allocate resources efficiently. There are four main types of market failure: 1) limited information and uncertainty, 2) external costs and external benefits, 3) monopoly power, and 4) public goods (Parkin et al. 2000:433).

A concrete example of market failure often referred to in SME policy and Innovation policy is the fact that the market may allocate too little resources to early-stage ventures than is socially and economically desirable. This example of market failure is arguably due to limited information (it is difficult to assess the merits of an early-stage firm) and externalities (funding even a loss-making early-stage enterprise may benefit society as a whole e.g. through the new ideas and spin-offs).

To correct for market failure, there are four basic approaches that policy can take when supporting firms. These approaches (illustrated in Figure 10) are based on the type and level of government intervention in the market.

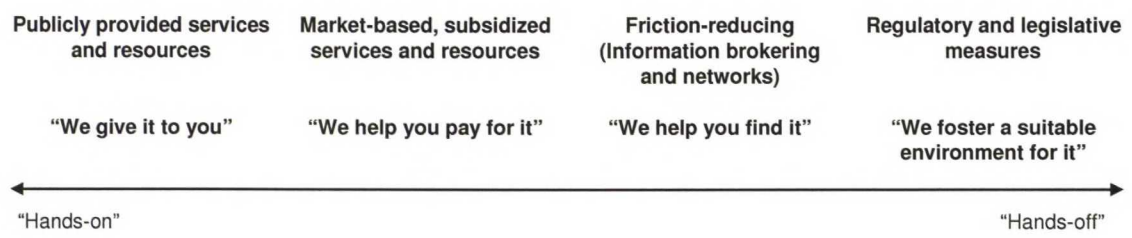


**Figure 10. Market intervention approaches for public support measures**

The first approach is for the government to supply the service or resource itself. Using the example of early-stage financing above, this could involve setting up a government-run venture capital fund. The second approach is to subsidize the market to provide more of the services and resources; an example would be to encourage venture capital funds to allocate greater amounts of capital to early-stage ventures through subsidized (e.g. with asymmetrical payoff) co-investments. The third approach is to reduce friction in the market, i.e. help to match supply with demand. To support early-stage venture capital, this could involve setting up networks between business angels and entrepreneurs. The fourth approach is to help the market work better through e.g. laws and regulations; an example could involve easing the restrictions on pension funds to let them invest a larger part of their capital in early-stage ventures.

The types of approaches taken can thus range from the very interventionist "hands-on" approach of public provision, to the "hand-off" approach of fostering a suitable environment for the market work in. Countries may take different approaches to providing services and resources to firms, and the appropriate approach will depend both on the nature of the service or support to be provided as well as on the national context. Furthermore, these approaches are not mutually exclusive, and many different measures with different market intervention approaches may be employed simultaneously to correct for the same market failure.

## 3.2 SME policy

SMEs constitute a fundamental part of the economy in both industrialized and developing nations. According to the OECD (2005b), 95% of all manufacturing enterprises in the organization's member countries are SMEs, and these SMEs provide two-thirds of the total employment in private companies and they are also the principal creator of new jobs. SMEs are also increasingly seen as an important source of innovation. Thus, not surprisingly, there are many governmental programs and initiatives that seek to promote the SME sector; these are typically jointly referred to as

SME policy. But policies related to SMEs also span other policy areas, such as environment policy and fiscal policy; as a result, e.g. the EU has introduced a so-called "think small first" principle, intended to be implemented across all EU policies, implying that the needs of small firms are to be a primary concern for all types of policy decisions (CEC 2005a).

The objective for SME policy is to encourage growth and employment through the formation of new enterprises and the growth of small firms. The main types of actions that are directed towards accomplishing this goal consist of regulatory measures, provision of appropriate support to SMEs, and promotion of an entrepreneurial culture (CEC 2005a).

SME policy has undergone significant development over the last decade, and it is therefore challenging to map the whole field of measures. Nevertheless, one of the most comprehensive international catalogs of SME policy measures is that of OECD (2004), which tracks activities that governmental- and non-governmental organizations employ to support SMEs and entrepreneurship. Relevant categories of activities include:

*Financing.* Finance has been recognized as one of the largest barriers to firm birth and growth. Measures in this category try to improve SME access to capital throughout the life-cycle of the firm; be it through e.g. bank loans or private equity markets (CEC 2000, CEC 2005c). Measures can facilitate access to various types of financing through either government-run funding schemes or by encouraging private financiers through guarantees, tax benefits, subsidies, and risk-sharing arrangements. Among the recent developments in this category we find e.g. relaxed restrictions on the investments in venture capital by pension funds and support for business angels networks (OECD 2005b)

*Entrepreneurship and firm creation.* These measures support the formation of new firms by e.g. improving the general business environment for start-ups. Relevant issues include access to markets, availability of skilled labor, and access to financing. Since red tape arguably has a more severe effect on small firms than on large firms, another important goal is to ease the cost and time required to start-up and run a small firm. This can be achieved through e.g. lighter reporting requirements, lower fees, and special assistance for SMEs. Also structural policies including those related to labor markets, tax design, competition, and bankruptcy laws have been recognized to impact entrepreneurial activity.

*Employment and human resources.* While SMEs are responsible for 60-70% of private employment in most western economies (OECD 2005b), a large part of SMEs employ no-one but the entrepreneur himself. Thus, several countries have policy measures directed towards encouraging 'micro-SMEs' to employ, through e.g. lower employment taxes for these firms. Another area of policy activity concerns the promotion of the skill level of the labor force. SMEs need to be able to access qualified labor in order to grow; however, on the other hand, SMEs tend to invest less in the continued training of their employees than do large firms. Therefore, it is important to both promote both good basic education as well as life-long learning of the work force. Finally, in order to foster an "entrepreneurial culture", entrepreneurship training is increasingly included in all levels of education (CEC 2000).

*Innovation and technology.* Although SMEs are often innovative in knowledge-based service sectors such as business and financial services and strong in 'informal innovation', i.e. the further development, refinement and adaptation of products and processes (OECD 2004), the innovative capability of SMEs is still lagging compared to that of large firms in most sectors (OECD 2005b). Thus, the aim of these types of measures is to support innovation by SMEs and develop a culture of innovation within these firms. Typical measures include programs that seek to: strengthen the technological capability of small firms, e.g. through support for investments in manufacturing technologies and ICT; improve SME access to finance for innovation; provide infrastructure, e.g. in the form of incubation centers; or encourage innovation networks and cooperation with larger firms. Since SMEs still have a weak understanding of the rights that are possible to obtain through IP (OECD 2005b), programs that disseminate information about patents and property rights and assist SMEs in obtaining these rights are also part of this type of measures.

*Clusters, networks and partnerships.* SMEs rely to a great extent on external cooperation with other firms and experts in order to access markets, information and know-how; this is especially true in technology-based sectors (OECD 2005b). A typical way to foster this collaboration between firms is to encourage the formation of clusters. A cluster can be defined as a sectoral and geographical concentration of firms which produce and sell complementary products (OECD 2004). Also other partnership types can be supported, such as those between SMEs and the public sector or large firms around innovation, or cooperation between firms around issues related to internationalization.

*SMEs in specific industries.* These measures specifically target SMEs in sectors that are regarded as strategically important. Such sectors typically include biotechnologies, environment-related technologies, and services. SMEs in these sectors can be supported through e.g. improved access to finance or support for increased cooperation around research.

*SMEs and globalization.* SMEs are still under-represented in world trade, but are increasingly growing their share. These types of measure support the internationalization processes of small firms. Measures may include support for financing or strategy formation for internationalization, support for the creation of SME networks for international trade or partnerships with global firms, or help with compliance with international rules or requirements. Also measures that improve access to information on e.g. foreign tax, regulatory requirements, and dispute resolution are common (OECD 2004).

*Local development and social entrepreneurship.* Entrepreneurship and small firms are considered important tools to foster social and regional development. This principle applies in both economically prosperous and depressed regions, although policy measures tend to focus on fostering entrepreneurship specifically in depressed regions through targeted support for regional or local development. Measures include supporting the formation of firm networks, improving the access to finance for local SMEs, and building the skill level of the work force within these regions. Entrepreneurship is thus seen as one of the principal vehicles to alleviate poverty and drive development in specific regions or cities by "helping people help themselves" (CEC 2000; OECD 2004).

*Women and minority entrepreneurs.* Women are still underrepresented in entrepreneurial activity as they are also in the work force at large; but self-employment is often considered one of the most important potential job options for women (OECD 2004). Thus, some SME policy measures target women specifically and encourage women to create new firms, e.g. by facilitating the financing of these businesses or assisting with child care. Also other minority groups often receive targeted attention by SME policy for similar reasons, including young people, older people, unemployed or foreigners.

SME policy is focused on the whole range of small firms, i.e. from micro-enterprises and family SMEs to high-growth "gazelles", and seeks to unlock the potential of all these types of firms in all stages of development (CEC 2005a). Nevertheless, there is a

trend that SME policies increasingly emphasize growth factors and growing firms. These factors principally include those above related to innovation, financing, training, and access to international markets.

## 3.3 Innovation policy

An 'innovation' is commonly described as a new process, product, or service that can be commercialized. An innovation is distinct from an 'invention', which relates to the earlier discovery of the process, product or service or the scientific result or idea behind these discoveries, but which is not yet at the stage of commercialization. Innovations bring increased welfare and growth through new goods and services, as well as through improvements in price, quality, or more economical of use resources.

The goal of innovation policy is thus to increase the overall level of innovation in society. Formally, the aim of this policy is often said to improve the "innovation system", i.e. the national infrastructure that supports innovation. Nevertheless, innovation policy act on both the macro and micro level; e.g. it may influence both the national syllabi in secondary education math as well as provide direct support to specific firms for the adoption of broadband internet.

The role of innovation policy started to increase in the 1980s, especially in Western Europe, where innovation was increasingly seen as a tool to improve the region's competitiveness and economic development. The policy commitment to innovation has been continuously reinforced since, e.g. through the Lisbon strategy in 2000. Nowadays, all industrialized countries pay close attention to innovation policy, and thousands of programs to support innovation have been implemented throughout the western world.

A number of initiatives and bodies track and catalog innovation policy measures. Examples include the OECD (2005a) and the European TrendChart on Innovation. The latter is an initiative of the Innovation Policy Development unit at the European Commission which tracks over 2000 innovation policy measures in European countries, and is thus one of the most comprehensive databases on innovation policy. Other projects that track innovation policy measures on specific themes include the Europe INNOVA and PAXIS initiatives, which focus on innovation policy measures targeted at a number of specific sectors and SMEs respectively.

Innovation policy measures can broadly be divided into 8 groups or themes as below. These themes are based on Arundel and Hollanders (2005).

*R&D programs.* R&D programs typically make up the main part of total spending on innovation policy. These programs provide financial resources for the research in public research organization and also provide direct or indirect support for research and development within private firms. Program can also use public procurement of new innovative products and services to drive innovation (CEC 2005b). The goal of these programs is to increase the spending on R&D as a percentage of GDP in both public and private organizations across all sectors, and to increase the share of firms that innovate. One specific goal within the EU is to raise the spending on R&D from 1,9% of GDP in 2002 to 3% of GDP by 2010 (CEC 2002), however, thus far there has been very little progress towards that goal. Nevertheless, a problem with these programs has been that governments have tended to view innovation as a pipeline. As The Economist noted, "if public money is stuffed into basic research in universities and national laboratories at one end, they reckon, new technology and commercial applications should pop out the other" (Economist 1999:8).

*IPR policies.* IPR, including patents, trademarks, design registration, and copyright, are increasingly in focus for innovation policy measures since IPR is considered an important driver of innovation and competitiveness. IPR has a clear link to firm growth: with better protection of intellectual property, brand names, and innovative processes, firms may raise venture capital more easily as well as grow confidently without fear that their critical resources may be expropriated (Kumar et al., 1999). The broad goals of innovation policy measures related to IPR are to promote the protection and optimize the exploitation of intellectual property as a driver of innovation. To this end, both legislative measures, e.g. defining what types of inventions and innovations that are patentable, as well as directed programs to increase the patenting rate can be employed. Common types of the latter type of programs include: 1) measures that encourage SMEs to apply for patents; 2) measures that encourage universities and other public research institutions to apply for patents, and 3) programs that disseminate information about IPR.

*Commercialization of public research.* The basic and applied research carried out at public research organizations such as public research centers and universities is commonly considered an untapped potential of valuable innovations. A number of measures have been taken in Europe to encourage commercialization of public research, including: 1) measures that support collaboration between private firms and public research

organizations; 2) measures that encourage researchers at public research organizations to be more entrepreneurial and patent or otherwise commercialize their research through spin-offs or licensing agreements; 3) measures that focus public research on the most promising areas for commercialization. One typical example of combining the first and third goals would be to set up joint private-public research networks or clusters to work on applied research within a field that has been identified as promising for new innovation. In order to encourage researchers to become more entrepreneurial, support programs can provide grants that enable researchers to develop their innovations towards commercialization. Nevertheless, commercialization of public research is a slow process and the results of these measures typically take a very long time to realize.

*Innovation collaboration.* Collaboration around innovation is important in order to achieve the critical mass of expertise required to develop new innovations and bring them to market. Many of the measures taken to this end are similar to the ones that seek to commercialize public research, e.g. support for collaboration between industrial and public research. In addition, these measures may seek to increase collaboration between private firms around innovation activities, e.g. through science parks, technology transfer and knowledge exchange programs.

*Innovation finance.* Limited access to financing for research and innovation is seen as one of the major obstacles to innovation, especially for early-stage ventures. Therefore, many measures seek to support financing of early-stage ventures by encouraging a more active venture capital market for these types of investments, e.g. through government-owned seed funds or through direct or indirect support for private VC funds. Also regulatory or fiscal measures that improve the conditions for venture capital financing or reduce the cost of research fall under this scope, as well as programs that facilitate contacts between investors and innovators/entrepreneurs.

*Human resources for innovation.* In order to encourage broad-based innovation, it is important to promote a well-educated workforce as a whole. Thus, the goal of policies under this theme is to increase the overall level of education. These include measures related to: 1) elementary and secondary education, in order to guarantee basic skills; 2) tertiary education, often with an emphasis on the sciences and engineering; and 3) adult education, with the aim of encouraging life-long learning and re-skilling the workforce if necessary. These measures thus seek to facilitate the access to skilled personnel, and

ensure that the future skill base in the region/sector/country will correspond to the needs of enterprises for innovation.

*Targeted technology support.* These programs target support to specific fields or technologies that are considered to be of strategic importance; typically advanced technologies such as biotech or ICT. On the supply side of innovation, programs can e.g. assign earmarked funds to research and development in these strategic fields. On the demand side, programs can encourage firms and individuals to adopt new technologies, e.g. through subsidies for manufacturing equipment or broadband internet.

*General innovation policy.* Innovation policy is a broad and constantly evolving field. In Arundel and Hollander's (2005) theme-based framework, this theme catches those measures that do not fit neatly into any of the themes above, such as measures that seek to increase the rate of non-technological innovation in enterprises. This type of innovation is important to recognize, as innovation policy often has an implicit focus on technological innovation, although other types of innovation may be equally important, most notably in the service sector.

All the above themes are naturally interrelated. For example, without the protection of intellectual property, it is difficult to increase the commercialization of research. Furthermore, as with SME policy, innovation policy has strong links to a range of other policy areas.

Innovation policy measures are typically targeted at firms of all sizes. A concrete example is the support of innovative industrial clusters, in which typically both big and small companies take part. Nevertheless, another discrete category that potentially could be added to Arundel and Hollanders' (2005) thematic framework above would include directed measures related to the support of innovation in *small firms.* For these firms, the above categories of IPR and financing are naturally important, but measures can also be directed at increasing the number of new innovative firms, by reducing the bureaucracy involved in setting up these firms; providing infrastructure to facilitate their growth, e.g. through incubation centers, and favoring the entry of these firms into specific markets, e.g. through public purchasing of innovative products and services from small firms. Such a category would thus contain many measures similar to those of SME policy as discussed in the previous section.

## 3.4 Relation between SME and Innovation policy

While the ultimate goals of SME policy and Innovation policy are similar, the philosophies and methods of these policies are somewhat different. Innovation policy sees the "knowledge economy" as a principal driver of growth (CEC 2002). By comparison, SME policy would consider the "entrepreneurial economy" as a principal driver. Nevertheless, while these policies are not the same, they are neither mutually exclusive.

In fact, it is evident in the sections above that several of the themes and types of measures employed by SME policy and Innovation policy respectively are remarkably similar. Figure 11 illustrates related themes.

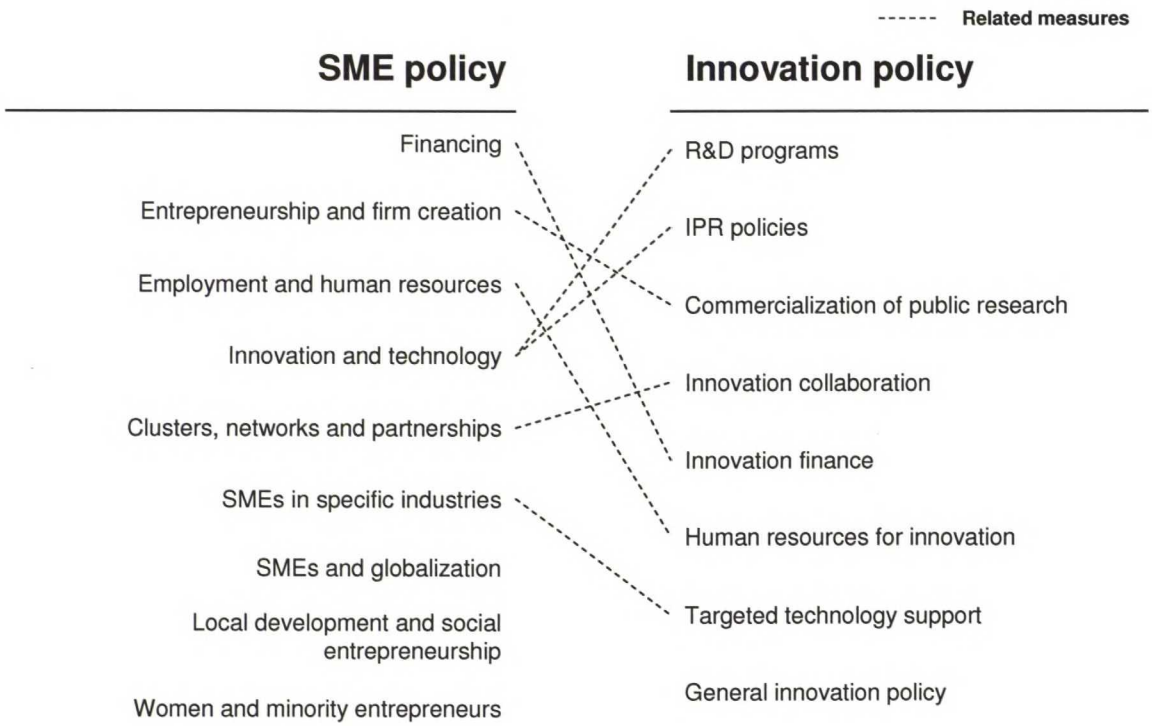


**Figure 11. Related measure types between SME policy and Innovation policy**

In terms of financing, both SME policy and Innovation policy seek to and provide seed funding for young ventures and encourage both the formal (venture capital funds) and informal (business angels) venture capital market. In fact, within innovation policy, the principal measures related to financing often target early-stage ventures specifically. Nevertheless, SME policy also has a strong focus on supporting bank loans for small firms that do not target rapid growth and innovation, while innovation policy also support large firms through e.g. tax breaks for R&D.

In terms of the relation between firm creation in SME policy and commercialization of public research in Innovation policy, the (admittedly somewhat weak) connection lies in that both encourage the creation of spin-offs from universities and other public research institutions. Nevertheless, as university spin-offs constitute only a very small part of all start-ups, SME policy clearly takes a broader view by supporting all types of start-ups, e.g. through the reduction of red tape and a range of other structural policy measures.

Both SME and Innovation policy encourage R&D and technological development through various programs, although SME policy is more limited in focusing on solely on technological development within SMEs while innovation policy seeks to support research in both public institutions as well as in all types of private firms. Both types of policies also try to encourage a more active use of IPR, although innovation policy also here takes a somewhat broader perspective, both policies have a particular focus on supporting SMEs due to the typically low patenting rate of small firms.

Concerning human resources, an almost identical goal for SME and Innovation policy is to promote the general skill level of the population, particularly in the sciences and engineering. Furthermore, SME policy has an additional focus on training current as well as potential future entrepreneurs and managers, supporting micro-SMEs to grow, and encouraging an "entrepreneurial culture".

An additional identical type of measures between SME policy and Innovation is the promotion of collaboration around innovation in clusters and networks. These clusters may be most effective when both large as well as small firms collaborate, and both types of policies also realize that there may be an important role to play for public research institutions within these clusters. Furthermore, both SME policy and Innovation policy employ the practice of targeting specific strategically important sectors - typically industries with high technology content - with additional support.

However, the largest differences between these types of policies lie in the focus of SME policy on social development and minority entrepreneurship, which have no equivalents in innovation policy, and in the broader view on innovation that innovation policy takes compared to SME policy.

Finally, it is unfortunately common to both SME policy and innovation policy measures that their effectiveness is very difficult to access. As a result, there are very few publications that would evaluate these policies. The publications that do exist and that

also have been referred to above rather tend to list all practices instead of identifying or evaluating best practices.

## 3.5 High-growth policy

While no comprehensive definition of "high-growth policy" exists, it seems clear that this type of policy has its foundation in both SME policy and Innovation policy and can be argued to exist in the intersection of these policies. In fact, there is a convergent trend towards a greater cohesion between SME policy and Innovation policy that tends to strive towards what we may define as high-growth policy. SME policy is increasingly recognizing the importance of innovation, risk financing and clusters as important drivers of growth; while Innovation policy increasingly emphasizes the support of innovation driven by SMEs. For example, the European PAXIS program is aimed at identifying measures for supporting start-ups within the realm of innovation policy.

Nevertheless, based on the body of knowledge on firm growth and the current portfolio of programs in SME and Innovation policy, it is possible to identify certain features that high-growth policy arguably should have in relation to SME and Innovation policy.

First, what should characterize high-growth policy is a high degree of selectivity. Since a majority of jobs are created by only a small group of all SMEs and start-ups, high-growth policy programs should focus on these few "potential high-growth firms" instead of spreading resources equally to all firms. A concrete example concerns government seed funds that potentially could apply stricter criteria when selecting investments, and thus e.g. invest 200.000 EUR in 10 firms instead of investing 10.000 EUR in 200 firms. In terms of financing, governments should also put a greater emphasis on promoting equity financing (e.g. venture capital) in contrast to supporting bank loans, due to the high-risk nature of high-growth start-ups. The principle of "picking winners" could be applied to other types of business support services as well. Furthermore, it is important that business support services such as advice on growth or internationalization are of a very high quality and thus relevant to high-growth firms.

A higher focus could also be applied when encouraging people to pursue an entrepreneurial career. High-growth entrepreneurs are likely to have a higher than average education and more likely to be currently employed (GEM 2005). Thus, policy should to a higher degree prioritize encouraging also currently employed people to

pursue an entrepreneurial career; a practice, however, which may be in conflict with common SME policy values such as social and regional development.

Another feature of high-growth policy would be to accept a high degree of dynamism and accept firm failure and bankruptcy. While SME policy often may focus on increasing entry rates and decreasing exit rates of firms, high-growth policy by comparison should focus on the *quality* and growth potential of new firms and accept firms exits as a normal consequence of an innovative and dynamic economy. Thus, potential high-growth entrepreneurs that have failed should be provided with a genuine chance to try again, e.g. through personal bankruptcy laws.

## 3.6 Key themes in high-growth policy

Based on the process of firm growth as well as the focus areas of SME policy and Innovation policy, a number of distinct themes emerge as key to high-growth policy. These themes concern financing of early-stage ventures, research and development, commercialization, internationalization, as well as the motivation of the entrepreneur. This section will briefly discuss the issues that need to be considered for effective policy-making within each of these themes.

### 3.6.1 Motivation

As we have seen in the previous chapter, motivation is a major determinant of the growth of firms. Therefore, high-growth policy measures will need to address entrepreneurs' growth motivation. These measures are most likely to be effective if young firms and young entrepreneurs are explicitly targeted, since growth motivation tends to decrease substantially with the age of the firm (Evans 1987) as well as with the age of the entrepreneur (Boswell 1972).

Policies can also act on the environmental level and encourage a more positive attitude towards risk-taking and entrepreneurship through for example legislation and tax reforms (KTM 2004b; CEC 2006a).For example, tax incentives can be used to enable a larger economic upside to entrepreneurship and policies involving social security and bankruptcy laws can be important in order to limit the downside.

### 3.6.2 Financing

An adequate supply of capital is essential if high-growth firms are to be born and grow in an economy. Not surprisingly, financial market development has been shown to have

an effect on both the rate of new-firm births as well as firm growth (Rajan and Zingales 1998; Kumar et al. 1999). While finance is crucial to any early-stage firm, firms that want to grow quickly can face disproportionately large obstacles due to the relative scarcity of risk financing.

Broadly, there are three stages of financing that entrepreneurs and firms need for growth: first, seed financing to establish a business plan and develop a product or service; second, start-up financing for start-up related costs such as investments in production and initial marketing; third, growth stage financing for expansion costs and continued development of new follow-on products or services (KTM 2004a). Of these, seed financing is typically the most difficult to obtain, due to the very high uncertainty at this stage.

Due to the high-risk of young ventures, business angel and venture capital financing are the most appropriate sources of capital for these firms. Nevertheless, it is often argued that there is a market failure in the supply of early-stage funding (e.g. CEC 2005d), a so-called "equity gap". Studies in Finland (LTT-Tutkimus 2005), the UK (HM Treasury 2003), and Australia (Australian Institute for Commercialisation 2004) have put the equity gap at 200.000-1M EUR. Proposed reasons for the equity gap include historically low returns on early-stage investments, at least in Europe (LTT-Tutkimus 2005); a high degree of uncertainty and information asymmetry between the entrepreneur and the financier (LTT-Tutkimus 2005); a lack of a sufficiently large business angel community (CEC 2006a); and a lack of venture capital funds in Europe that specialize in financing early-stage investments.

In order to address a scarcity of supply of early-stage financing, governments often start VC funds of their own. For example, in Finland, the government is the largest venture capitalist. Nevertheless, governments need to be careful not to crowd out private investment or distort prices in the market (Buss 2001). The EU has therefore argued that governmental VC funds should explicitly have a counter-cyclical role in order to not crowd out private investment in early-stage ventures (CEC 2006a). Alternatively, governments can subsidize the private VC market through e.g. public/private co-investments schemes (CEC 2005d; LTT-Tutkimus 2005) or tax incentives for private individuals that invest directly in early-stage firms. An asymmetric profit model has been argued to be the support principle with the highest effectiveness and the least distorting effect on the markets (Maula and Murray 2003). An asymmetric profit model also seems

appropriate since private investors usually take a bigger role in the management of the funded firm than do the public investors. Another often-used approach is to arrange training and networking events for business angels and set up forums where potential investors can meet with entrepreneurs.

Governments can also address the demand-side of early stage financing by providing entrepreneurs with the skill and experience to make their firms "investment-worthy" (KTM 2004a). Typical training for entrepreneurs involves information on financing alternatives and on how to approach finance providers such as banks, business angels and venture capitalists (CEC 2005c).

### 3.6.3 Research, commercialization and technological development

In order to remain competitive in the global market, growing firms continuously need to innovate and thus generate novel products and services. This high-growth theme generally involves three goals: to create wholly new innovative firms through the commercialization of new technologies and spin-offs; to encourage existing firms to become more innovative; and more broadly, to improve the technological and innovative level of the society as a whole.

Spending on these types of R&D measures typically represents the largest share of public financing to support innovation, and this support can be in the form of direct financial support for applied R&D in the public research sector, or either direct or indirect financial support for business sector R&D and innovation (Arundel and Hollanders 2005)

In order to support new technological-based firms, measures can e.g. support the IP protection of technologies, proof of concept or prototyping activities, as well as market analysis activities for the innovation. These activities in may be particularly important for policy measures to target since these typically are carried out at an early stage where technologies are unproven and the market uncertain, and thus a valuation of the firm is extremely challenging which in turn makes raising external equity financing difficult. The protection of its intellectual property in particular has been put forth as a critical issue for small firms to secure a competitive advantage through their innovations and thus be able to raise risk capital (CEC 2006a; Arundel and Hollanders 2005).

To support the commercialization of research, universities should be given larger incentives to license their technologies to firms (CEC 2005d). For example, in Finland, research-derived business ideas emerge at universities at an annual rate of around 500 (Speech by Minister of Trade and Industry, Mauri Pekkarinen, 30.9.2004). However, European countries have traditionally been quite weak in turning this research into new innovative products and services (CEC 2006a). Support measures can also improve the infrastructure for innovation, e.g. through incubators, science parks and knowledge transfer organizations.

To support industrial innovation, smart use of directed R&D grants and fiscal incentives for industry seems to be the most effective support measure – especially if these incentives are used in the context of coordinated innovation initiatives and clusters (CEC 2006a). While it has been argued that tax incentives can provide a simpler way to support firm research and innovation than grants (CEC 2002), the use of tax incentives can lead to less flexibility in targeting specific innovations and technologies, while they are also unlikely to favor small high-growth firms since these firms typically do not make a profit. Tax incentives have also been suggested to be "addictive" and create subsidy-dependent firms (Buss 2001).

Support measures can also address the demand-side of innovation. According to a report by the European Commission, "demand-side deficiency is the primary barrier to investment in research and innovation in Europe", and policy has a role to play by acting as a lead user and thus encouraging an innovation-friendly market (CEC 2006a).

### 3.6.4 Business development

It will arguably be important for high-growth policy to not only target technological capabilities, but also support the business capabilities of the firm. The entrepreneur or the original management team of a high-growth firm are not uncommonly technically oriented and may not possess the skills required to lead the firm through a growth process. Therefore, these firms need to be able to attract competent management personnel as well as access professional business advice.

In order to attract good management and employees, high-growth firms will need to use financial instruments such as options. Therefore, in order to support these firms, the taxation and regulatory treatment of employee options should be favorable so that

options are seen as a feasible and efficient tool for attracting and retaining high-quality human resources in the firm.

High-growth firms will typically need highly sophisticated professional business services that are customized for the needs of each firm. To facilitate access to professional business services, these services can be subsidized e.g. through "service checks" (KTM 2004b). This approach may contribute towards a related goal for policy to develop the small-firm specific capabilities and competencies of private-sector providers of professional business services, such as consultants, accountants and bankers. Business coaching programs constitute another common way to support the business development of firms and broker access to professional business services.

### 3.6.5 Internationalization

Firms that want to grow quickly – especially those in countries with small domestic markets – often need to go through an early internationalization process. Meanwhile, trading internationally can be expensive for young firms due to high fixed costs of internationalization activities. Costs accrue for attending trade shows, establishing sales and market channels, customer support, attracting internationally competent employees, and adapting products to the tastes of customers in a different market.

Many countries have so-called Export Promotion Organizations (EPOs) that are exclusively dedicated to promoting the international activities of domestic firms. The specific goals for EPOs, according to Seringhaus and Botschen (1991), are: 1) to develop a broad awareness of export opportunities and to stimulate interest for export in the business community; 2) assist firms in the planning and preparation for export market involvement; 3) assist firms in acquiring the needed expertise and know-how successfully to enter and develop export markets; and d) support such foreign market activity tangibly through organizational help and cost-sharing programs.

Internationalization support measures that can be considered the most crucial for born global firms include support for concept testing in major markets (KTM 2004a) as well as support that facilitates access to managers with international experience.

Nevertheless, many national EPO provisions are geared towards the internationalization needs of 'traditional' domestic-based firms, and do not cater to the specific needs of born globals (Bell et al. 2003). For example, born globals typically have little need for 'export stimulation' while any standardized market information may not specific enough

to serve the needs of these global niche-players. Furthermore, the need for financing of born globals that often enter several international markets simultaneously may be greater than the offered levels of EPO support.

Policy measures can also work to reduce barriers to entry for small firms by harmonizing national regulations. A related issue is the need to harmonize and simplify the protection of intellectual property internationally, as well as strengthen these rights in developing countries.

# 4 Methods

The goal for the empirical part of this study is to identify and analyze the characteristics of successful support measures for high-growth firms. For this purpose, support measures from 9 different countries have been collected, filtered, analyzed and compared.

This study largely follows the tradition of qualitative research. Since the phenomena of support measures, their context and effects are highly complex, I considered a multiple-case study to be the most appropriate research method. A case study can be used when investigating a phenomenon within its real-life context when the boundaries between phenomena and context are not clearly defined (Yin 1994), it is an appropriate method in new topic areas (Eisenhardt 1989) and in coping with situations where there will be many more variables of interest than data points. The unit of analysis for the case study is the individual policy support measure.

While it might have been possible to generate some relevant results also using more quantitative methods, any results or conclusions of such an analysis would still need to be explained through in-depth analyses of the successful measures to verify and understand the apparent success factors. Using regressions was not considered a viable alternative, since it is extremely difficult to identify and code all relevant variables for such an analysis to be sufficiently robust; the researcher would not only need to identify all relevant variables of the support measure itself, but also capture those of the national environment or context of the support measure. Another alternative method would have been to carry out a case study on successful high-growth firms while identifying and analyzing what policy support measures these firms have benefited from. However, such a method was not considered to yield as relevant results as the employed method, since many support measures for high-growth SMEs are very new and considering that the time from firm birth to success typically is as long as 5-7 years (Hanks et al. 1993).

Nevertheless, consistent with the case study research tradition, I will employ triangulation between several methods. I will use within-case analyses of the most successful measures as the principal method of analysis. Within-case analyses have been recognized as central to the generation of insight (Eisenhardt 1989; Pettigrew 1990),

since they offer a structured way to deal with and gain a close familiarity with enormous amounts of data. Second, I will compare these successful measures and identify commonalities (across-case analysis). Furthermore, all support measures, including those that were not separately described and analyzed, will be grouped in emergent categories of similar measures for a subsequent across-case analysis between measures within the same category. Third, when appropriate, I will also employ statistical analysis of various coded variables. This method will mainly serve to provide indicative evidence and illustration of insights and claims. By using multiple methods, I have thus sought to combine both qualitative and quantitative data in order to create a more synergistic view of the evidence (Eisenhardt 1989).

## 4.1 Data collection

In order to develop comprehensive data on relevant support measures from a sufficiently broad range of countries, the study was organized as a collaborative effort between research teams participating in the Global Entrepreneurship Monitor (GEM) consortium (www.gemconsortium.org). The selection of countries from which cases were sampled was opportunistic as national teams volunteered to participate in the study. The following countries and teams participated:

**Table 4. Participating countries and teams**

| Country | Participating institution | Team leader | Team researcher | Main sponsor |
|---|---|---|---|---|
| **Australia** | Swinburne University of Technology | Kevin Hindle | John Yencken | Westpac Banking Corporation |
| **Brazil** | Instituto Brasileiro da Qualidade e Produtividade no Paraná | Marcos Mueller Schlemm | Paulo Alberto Bastos | SEBRAE |
| **Finland** | Turku School of Economics | Anne Kovalainen | Mathias Kronlund | Ministry of Trade and Industry |
| **Hong Kong** | The Chinese University of Hong Kong | Bee-Leng Chua | Hugh Thomas | Trade and Industry Department |
| **Hungary** | University of Pecs | Laszlo Szerb | Csapó Krisztián | Ministry of Economy and Transport |
| **Italy** | Bocconi University | Guido Corbetta | Alexandra Dawson | Bocconi University |
| **Netherlands** | EIaM Business & Policy Research | Sander Wennekers | Jolanda Hessels | Dutch Ministry of Economic Affairs |
| **Spain** | Instituto de Empresa | Ignacio de la Vega | Alicia Coduras | Fundación cultural Banesto |
| **UK** | University of Glamorgan | David Brooksbank | Elin Aaron | Welsh Development Agency |

Within each individual country, the sampling of cases was based on theoretical sampling through a network approach (a "snowballing" technique). That is, cases were rather purposely than randomly chosen. This method does not portend to produce a representative sample or a complete portfolio of all measures that are directed at high-growth SMEs, but rather generate a selection of a number of measures that policy

makers themselves consider important, successful or novel. Thus, although the sample is neither random nor exhaustive, it ensures a good representation from the "top-end" of the policy spectrum.

While the non-random choice of countries and cases may raise some questions in terms of the generalizability of the approach, the voluntary participation of national teams in the GEM research consortium and the purposeful sampling of cases were considered extremely valuable in order to better access and leverage the expertise and experience of domestic researchers and policy makers. For example, Patton (1990) notes that the main benefit of purposeful sampling is that it may lead to more information-rich cases. Thus, on the whole this approach was considered to lead to better constructs and insights.

Since the study mainly takes a Finnish perspective, support measures from countries which are similar in economic structure and development to Finland were assumed to be the ones that would produce insights with the highest external validity and relevance. Nevertheless, support measures from other countries were also considered valuable given that caution always must be exercised when transferring support measures and lessons learned across regional and national boundaries.

The teams were given significant freedom in independently identifying and choosing support measures that were targeted at high-growth firms in their country. This was done in order not to influence the sampling e.g. towards any particular type of measure.

The following instructions were provided to the teams for guiding the process:

- Identify 4-5 policy measures directed at high-growth entrepreneurial companies and interview policy makers about each policy measure. Use a snowballing technique to identify relevant high-growth policy measures and knowledgeable policy makers.
- Provide a detailed description of each identified policy measure. Also collect relevant background materials, including reports, brochures, interview notes and weblinks.

In order to collect comparable data from all countries, the most important data for each measure was described and reported in the form of a centrally designed summary sheet. The summary sheet used by the majority of teams is included in Appendix 1.

The material was collected between October 2005 and June 2006. There was an overlap of data collection and analysis, which part was intentional in order to focus the research, and part necessary as the teams reported their data at different times throughout the project. Nevertheless, this overlap provided an opportunity to make some helpful adjustments to the data collection process based on the emergent finding and feedback from the teams. Thus, during the course of the study, some changes were made to the summary sheet in response to feedback from the teams to clarify any ambiguous terms or to include additional information on the measures that was considered relevant.

The information that was collected for each measure included the following:

1. Basic information: name of measure; year started; contact information; website
2. Organization of the measure: participating institutions; budget; main financiers; number of staff
3. Operational data: description of the form of support; focus of the support, including targeted resource bottleneck, firm life cycle stage, and industry/sector
4. Results: number of firms or projects processed in total and annually; other relevant quantitative performance data; a qualitative evaluation of the measure (not successful / somewhat successful / successful / very successful); notable success stories
5. Lessons learned: what was found to work well, what was changed, how the initiative would be changed today; comments

While some of the data was "hard" and thus could be easily obtained from published materials and interviews, some of the data required a certain level of discretion and analysis of the teams, e.g. in order to evaluate the successfulness and the lessons learned for each measure.

The reported data on the measures was triangulated with archival data, using the web as the principal source. I also took comprehensive field notes while analyzing the measures as well as in multiple discussions with researchers from the other national GEM teams, which provided important additional insights.

I also opportunistically checked and discussed emerging insights, ideas and constructs in interviews with other researchers and in the semi-structured interviews that I carried out in Finland on specific support measures. Interviews were conducted with the following experts:

**Table 5. Interviewed experts in Finland**

| Interviewee | Date | Organization | Support measure |
|---|---|---|---|
| Kimmo Hyrsky | March 16, 2006 | Finnish Ministry of Trade and Industry | n/a |
| Pertti Valtonen | March 20, 2006 | Finnish Ministry of Trade and Industry | AISP |
| Juha Saapunki and Jusa Susia | March 23, 2006 | SME Foundation PKT | Growth Firm Service |
| Heli Kukko | May 24, 2006 | National Technology Agency TEKES | Research into Business (TULI) |
| Risto Kalske | June 6, 2006 | Finnish National Fund for Research and Development (Sitra) | INTRO |

Stock exchange data was also requested from the teams for the country's top 20 firms in 1984, 1994, and 2004, and from the history of the country's "new market". Originally, I intended to use this data for making assessments on the volatility and growth of innovative firms in the different countries. However, this data was dropped from further analysis since relevant data could be obtained from only very few countries, due to e.g. a lack of a "new market" or a limited history of the market.

## 4.2 Data analysis

Data for a total of 88 cases was collected in the data collection phase. Of these, 41 cases were dropped from further analysis. The reason for leaving these cases out was either due to too limited data which made an analysis impossible (36 measures); or that a case was not relevant as an example of a public policy support measure - these included private sector initiatives or governmental laws and decrees (5 measures).

I also assessed whether some cases should be further filtered out on the grounds that they were not necessarily relevant to high-growth SMEs. Such cases would include support measures that targeted mainly larger firms or measures that benefited all small firms regardless of growth ambition. However, I chose not to make this further distinction since there would be no grounds on which to draw a line that would be sufficiently non-arbitrary, and with respect to the teams that had already sampled these cases as relevant examples of support measures for high-growth firms.

After filtering, 47 cases remained for the analysis. The number of cases per participating country ranged from 2 to 9, as illustrated in Table 6.

**Table 6. Number of measures per participating country**

| Country | Number of analyzed measures |
|---|---|
| Australia | 9 |
| Brazil | 3 |
| Finland | 4 |
| Hong Kong | 4 |
| Hungary | 8 |
| Italy | 5 |
| Netherlands | 2 |
| Spain | 5 |
| UK | 7 |

For the analysis, I used a tabular form for arranging and providing an overview of the data (as suggested by e.g. Miles and Huberman 1994). For this purpose, I codified as much of the relevant data as possible - including data from the summary sheets, background materials, and interviews - in an excel sheet. The rows in the sheet represented individual measures, while the columns represented relevant dimensions of the data. In addition to facilitating within-case analyses, the tabular form facilitated comparison of the data across measures. When appropriate, I also carried out frequency and other statistical analyses on the data to facilitate the generation of insight.

I compared similar measures from different countries and made some adjustments in order to ensure a good level of consistency across countries. Furthermore, in order to facilitate construct validity for the cases, the codified information was re-distributed to each team and the teams were given a chance to confirm or make edits to the information (as suggested by Yin 1994). A number of minor changes to the codified data were suggested by the teams and the data was updated based on this feedback.

The resultant sheet of measures is attached in Appendix 2.

In case research, there is always a trade-off between analyzing a few very detailed cases in-depth or analyzing a larger number cases in less detail. This trade-off was dealt with using the approach that out of the 47 cases, the 25 support measures that were considered the most successful were described and analyzed separately (within-case analysis) in section 5.1 and compared with other successful cases (across-case analysis) and used for generating successful characteristics of measures in section 5.2. The remaining measures were not described and analyzed separately but nevertheless used for the generation of aggregate categories of measure (in the beginning of section 5.3). Furthermore, all measures within each category were compared with each other and analyzed as a group in order to generate good practices for each type of measure.

The choice to separately describe and analyze only the most successful measures was made in order to concentrate on best-practice measures, which is coherent with the goals of the study to identify good practices. One of my underlying assumptions is thus that good measures have more in common than poor measures (in Tolstoy's words, "happy families are all alike; every unhappy family is unhappy in its own way"), and that we therefore can learn more from looking at the commonalities of successful cases.

However, by doing this, I somewhat limit the opportunity to compare and contrast successful measures with less successful measures. Nevertheless, this opportunity was regarded as rather small, since the snow-balling method used for data collection was assumed to skew the distribution towards more successful measures as interviewees were assumed to generally be inclined to talk about success stories and not failures. This is also confirmed by the distribution of the successfulness of the measures, as illustrated in Table 7. Out of the 47 measures, 16 were regarded "very successful", 21 as "successful", 3 as "somewhat successful", and 2 as "not successful"; 5 measures were not evaluated by the teams, due e.g. to the newness of the measure or lack of data.

**Table 7. Success of reported measures**

| Degree of successfulness | Number of measures |
|---|---|
| "Very successful" | 16 |
| "Successful" | 21 |
| "Somewhat successful" | 3 |
| "Not successful" | 2 |
| (Not evaluated) | (5) |

The 25 cases that were selected for detailed study contain all 16 measures that have been classified as "very successful" and 9, or about half, of those classified as "successful". The measures classified as "successful" have been sampled as to first include measures from countries that classified none or few measures as "very successful". Where very many equally successful measures existed, the measures were sampled based on the degree to which they focused exclusively on high-growth SMEs.

# 5 Analysis and results

The analysis starts with a within-case description and simultaneous analysis of each of the 25 support measures that were selected for detailed study. After this, I will discuss across-case commonalties, success factors and lessons learned for the selected cases. Next, I present a categorization and a thematic framework for high-growth policy measures, and analyze and compare the measures within each theme separately. This categorization and related across-case analysis is based on all measures, i.e. not only those selected for detailed study. Finally, I will apply all measures to selected frameworks from the previous sections.

## 5.1 Case descriptions and within-case analysis

This section will present a case descriptions and concurrent analyses for the 25 support measures that were selected for a more detailed analysis. It was necessary to limit the cases as a separate analysis of all 47 measures that were reported for this study was not possible. Yin (1994) proposes that when selecting cases to study, the researcher should focus on critical cases, extreme or unique cases, or revelatory cases. For this study, I chose to concentrate on the 25 *most successful* cases. Furthermore, in order to simplify the structure of the thesis and group all relevant information for each case in one place, I have chosen to combine the case description with the with-in case analysis for each each.

Each case description contains the basic characteristics of the measure followed by an account of the results and a brief analysis of good practices and lessons learned. The descriptions vary in length since the information that was obtained for different cases varied.

### 5.1.1 Australia

#### 5.1.1.1 Commercial Ready Program

www.ausindustry.gov.au

The Commercial Ready Program was started in 2004 by the Australian Department of Industry, Tourism and Resources. The program offers grants to SMEs for commercialization activities, and it has been regarded as very successful.

**Description**

The commercial ready program provides competitive merit-based grants to SMEs for commercialization activities, for R&D activities with high commercial potential, and for proof-of-concept activities. The program supports both R&D in new ventures as well as applied research leading to new innovations by established SMEs.

The aims of the program are to support Australian businesses in the technology sector to develop innovative products and processes, and to encourage collaboration between industry and research institutions.

The grants range from 30.000 EUR to 3 MEUR, and they require matching contributions by the receiving firms. Thus, the grants can be considered subsidies for commercialization activities. The program is exclusively targeted at SMEs in any stage of development and projects can be supported for up to 3 years.

The program was started in 2004 by AusIndustry, which is part of the Australia Department of Industry Tourism and Resources. The budget of the program is 120 MEUR annually until 2011.

**Results and Lessons Learned**

In 2005-06, 600 firms were supported through the program. The average support was approximately 200.000 EUR per firm.

The program is generally considered very successful. It is highly regarded by firms and there are more applicants than funds available.

However, due to the requirement of matching contributions, access to the program is in effect limited to firms that already have significant financial resources. It is thus rarely accessible for very young firms that do not already have a steady cash flow. An exception is start-up firms that have already received some type of VC financing, for whom the Commercial Ready program can function as a supplementary source of funding.

Nevertheless, the program is particularly useful to SMEs in the expansion stage, e.g. to support the funding of product customization activities for a new market. The program can thus contribute to an increased growth motivation for established SMEs by promoting the continued development of new products and product lines.

### 5.1.1.2 Commercializing Emerging Technologies (COMET)

http://www.ausindustry.gov.au/index.cfm

The COMET program is a very successful program started by the Australian Department of Industry, Tourism, and Resources in 1999. The program sponsors commercialization of new technologies by subsidizing business development services for technology-based ventures.

**Description**

The program provides subsidies of 80% for business development activities such as marketing, commercialization, and IPR management services to individuals (e.g. researchers) and small firms in their early stages who want to commercialize a new technology and target significant growth. Examples of supported activities include market research, product trials, and patenting. The program is competitive and the services are offered through a network of affiliated private sectors advisors. The criteria by which applicants are selected are that the firms: (1) must be looking to grow substantially through the commercialization of an innovative product, process or service; (2) have identified weaknesses that are preventing them from implementing a commercialization strategy; and (3) are unable to fund activities to address these weaknesses.

The annual budget for the program is 6,5 MEUR, and the typical size of support is 50.000 EUR per firm or project. A 50% subsidy for an additional 50.000 EUR can be obtained in a second stage of the program. The program targets all technology sectors.

**Results and Lessons Learned**

Thus far, the program has assisted 300 firms. The program has been extended and expanded and was rated as very successful in an independent review prior to its continuation. For example, in the five years to July 2004, firms supported under COMET raised around 215 MEUR in capital and created over 500 strategic alliances, licenses, and other agreements. The program has also been shown to increase the motivation of participating firms. However, there has been a shortage of experienced people in specialist areas that can assist the firms over the full 12 months of support. The network of affiliated advisors is currently being expanded to cover a larger area of expertise.

### 5.1.1.3 Co-Operative Research Centres

www.crc.gov.au

The Co-Operative Research Centres program was started by the Australia Department of Education, Science and Training in 1990. The program attempts to bridge the gap of research commercialization by sponsoring partnerships between public research institutions and the research units of private firms.

**Description**

The program works by establishing joint private-public research partnerships in select strategic sectors and technologies. There are approximately 70 established co-operative research centers in 6 sectors: environment, agriculture, ICT, mining, medical science, technology and manufacturing.

The CRC program addresses the issue of turning research into innovations and marketable products and services. The fundamental idea is to "bring together researchers and research users" in the form of universities and private firms respectively, and thus function as a bridge from basic research, via applied research, to commercialization. An example of a CRC is the Cooperative Research Centre for Greenhouse Gas Technologies. In the centre, researchers from 7 universities and public research institutions collaborate with researchers from 6 private firms such as BHP Billington, BP, as well as from governmental agencies to create a leading research organization in the field for developing technologies that reduce carbon-dioxide emissions.

The CRC program also has a strong education component through which it seeks to train skilled graduates in the targeted technologies.

The government is the main financier of the research, but private firms also participate in the funding of the program. Over 12 years, 5.8 billion EUR has been committed to the program and approximately 600 projects have been supported.

**Results and Lessons Learned**

A recent rigid and conservative review of the program showed that "the Australian economy's overall performance has been considerably enhanced when compared to the performance that would have incurred in its absence".

The program can be seen as a step towards establishing a certain critical mass of researchers and resources in order to successfully develop new technologies in strategic

sectors. While the research centers typically do not involve small firms or new start-ups, the program has a solid record of generating spin-offs with high survival and growth rates.

However, while some important steps towards more effective research commercialization have been taken with the program, the evaluation noted that in "submissions, discussions and consultations there was a strong view that the CRC Program should have a much greater orientation towards commercialization" and thus have a greater focus on delivering industrial, commercial and economic outcomes. Therefore, for the selection rounds in 2006 and 2008, CRC applicants are required to demonstrate clear paths to commercialization and utilization and strong industry commitment; contributions by partner organizations must at least match program funding; and CRCs are also required to describe their contribution to achieving the National Research Priority Goals.

#### 5.1.1.4 Innovation Investment Fund

http://www.ausindustry.gov.au/index.cfm

Innovation Investment Fund is a venture capital scheme created by the Australia Department of Industry, Tourism and Resources in 1998. Through this program, the government co-invests in early-stage equity companies together with private venture capital funds. The scheme has been considered very successful.

**Description**

Under the program, the government has licensed nine licensed private sector venture capital managers that provide venture capital to small, technology-based firms at the seed, start-up or early expansion stages of development. About one third of the capital is provided by private investors or VC funds, while the government provides the remaining share.

The aim of the scheme is threefold: first, to encourage the growth and development of new technology-based firms through the supply of venture capital; second, to develop a self-sustaining early-stage VC market in Australia; third, to develop experienced fund managers that are knowledgeable in early-stage VC investments.

The program provides for asymmetrical payoff, benefiting the private-sector investors. When distributing returns, both the government and the private-sector investors first receive an amount equivalent to their subscribed capital and interest on that capital. Any

further capital gains are shared on a 10 per cent to 90 per cent basis between government and private-sector investors. The private-sector investors' returns are shared with the fund manager as a performance incentive for the fund manager.

The total size of the funds is currently 65 MEUR, of which the government has contributed the equivalent of 44 MEUR. The government plans to invest an additional 7,8 MEUR during 2006.

**Results and Lessons Learned**

Approximately 75 firms have received funding through the program. The program is currently being evaluated but can generally be considered successful. The government has made a profit on its share of investment.

Nevertheless, although the program has been designed to be a scheme that supplies venture capital to early-stage firms, in practice, most participating firms have been in later stages of development. The program has established criteria for what type of firms that can funded through the scheme, but due to investor risk averseness, the invested capital has tended to go towards more mature ventures. Therefore, for the continuation of the program, the scheme is being redesigned in order to provide strong support for earlier-stage firms.

## 5.1.2 Brazil

### 5.1.2.1 Pappe - Program for Supporting Research in Enterprises

www.finep.gov.br/programas/pappe.asp

The Pappe Research Support Program was started by FINEP (the Brazilian Financing Agency for Studies and Projects) in 2004. This successful program promotes innovation and commercialization by providing grants to researchers and individuals in small firms for product development activities.

**Description**

The program provides grants to researchers for collaborative efforts with small companies around new product or process development. The receiving researcher does not need to supply matching funds. The program is similar to the Small Business Innovation Research Program (SBIR) in the US.

The supported researcher must be affiliated with a small firm in a technological sector, and the supported projects should be in a 'pre-commercialization' phase. By fostering

interaction between researchers and small firms, these firms can function as vehicles for bringing innovations to market. The program targets the manufacturing sector with an emphasis on high-technology products.

The annual budget for the program is 66 MEUR. FINEP carries out the program in collaboration with the S&T Foundations in 20 states, which locally select the projects to be funded and provide matching funds.

**Results and Lessons Learned**

The program has generally been regarded as successful. In the year from 2004 to 2005, 537 firms were supported.

Compared to other research commercialization programs in Brazil, which often benefit large firms, Pappe focuses on supporting the development and the innovative activities of small firms. Another somewhat unusual aspect is that the grant is provided to the researcher and not to the firm.

While a national program, the execution of the Pappe program is administered at the regional level. This collaboration between state- and regional-level innovation support activities has been considered an important goal in the project. Thus, besides fostering interaction between researchers and high-tech based firms for developing innovative projects, it is expected that Pappe will contribute to the convergence and consolidation of the local and national innovation systems.

### 5.1.2.2 PROGEX - Export Technology Support Program

www.cetec.br/progex/

The PROGEX export technology support program was started by the Brazilian Ministry of Science and Technology in 2001. The program seeks to improve the technological capabilities of export-oriented SMEs. The program has been successful in significantly increasing the value of exports of participating firms.

**Description**

PROGEX is a federal program established to stimulate Brazilian exports through micro- and small companies by improving the technological capabilities of these firms. The goal is to increase Brazilian exports and substitute imports. The program targets firms in all industrial, arts and crafts sectors, which are in the expansion and maturity stages of

development and that already export or are planning to expand into international markets.

The goal of the program is to 'reduce technical barriers' to trade by subsidizing various technology-related activities that are required to enter foreign markets. Examples of supported activities include technology consulting, logistics planning, and product modifications to meet the requirements of foreign markets. For example, the program can provide approximately 8.000 EUR per product adjustment for a particular market. These adjustments include e.g. changes to design and packaging as well as adaptation and compliance to international technical and quality standards.

The annual budget for the program is 7.8 MEUR, and more than one hundred firms are supported annually.

**Results and Lessons Learned**

The program appears to be successful in significantly increasing exports of the participating SMEs, in opening up new international markets, and in generating new exporting companies. So far, the program has assisted 270 firms.

The program may be considered successful in that it in a very concrete way can support firms to reach new markets with their products by e.g. meeting required quality standards. A lesson learned is that federal programs need to be able to reach into different country regions in order to have a larger impact.

Nevertheless, the program takes a traditional approach to internationalization and does not as such seem to recognize the special needs of born global firms. Furthermore, this type of measure may be most suitable in emerging economies where the technological capability of SMEs is still catching up with that of firms in the most technologically developed nations.

## 5.1.3 Finland

### 5.1.3.1 Growth Firm Service

No website

The Growth Firm Service program was started in 2003 by the Finnish Ministry of Trade and Industry. The program seeks to proactively identify firms and entrepreneurs with a high growth potential and direct these to appropriate services offered by various public agencies that support SMEs and innovation. This successful program is implemented as

a cooperative effort between these agencies, and it is coordinated by the independent SME foundation PKT.

**Description**

The goal of the program is to act as a 'one-touch shop' for public services relevant to growing firms. Four major public agencies that offer services to SMEs in Finland participate in the program, and through the contact with a business consultant in one of these agencies, a firm can get information about and be referred to appropriate services offered by all four institutions. These institutions are Finpro (Internationalization services), Finnvera (State-owned financing company), Sitra (Finnish National Fund for Research and Development), and TE-keskus (Regional Employment and Development Centers).

Consultants in all of the agencies proactively seek to identify promising growth firms. When identified, the consultant offers a growth analysis session with the firm, and based on the growth analysis, specific needs for achieving growth are prioritized and the firm is referred to appropriate services offered by the four participating institutions.

In total, there are approximately 100 different support services that can be offered by the participating institutions to the firms. The majority of these support measures concern financing, since financing is the main activity for 3 of the 4 participating institutions, while the fourth institution is focused on support for internationalization.

The target group of firms consists of SMEs with a high-growth potential, regardless of sector or industry. Nevertheless, most participating firms are technology companies, since these companies may often be more interested in the offered services. These firms are often in the expansion stages of development since firms younger than this may not yet be recognized ("on the radar screen") of the public business consultants. The youngest firms are often born globals or firms with a particularly strong technology-focus.

Each consultant or service is financed by the institution offering that consultant or service. It is estimated that approximately 300-400 people spend around 10-15% of their time on offering growth services. The cooperation between the institutions is coordinated by the private SME Foundation PKT and is financed by the Finnish Ministry of Trade and Industry. The budget for the coordination and follow-up of the program is 0,5 MEUR per annum.

**Results and Lessons Learned**

The growth firm service is distinctive because of its explicit focus on high-growth firms. The program is still being phased in, and it has been approximately one year in operation. So far, 300 growth firms have been identified and received a growth analysis through the program. This corresponds to approximately one firm per business consultant. It is thus clear that the number of firms that are supported through the program has room to grow significantly, although no target for the number of firms to be processed has been set. The total population of potential growth firms in Finland is estimated to be in the range of 2.000 - 30.000, depending on the definition of growth. The growth rates of the participating companies has not been analyzed yet, but an analysis will be carried out when enough time series data is available.

The program is generally considered to be successful. The participating firms have been very happy with the service, especially with the aspect of being approached proactively and provided with only one contact person who can broker all services. Very few of the approached firms have declined a growth analysis,; those few firms that have done so have argued that they do not need any of the services that the four participating institutions have to offer.

A key lesson has been that the coordination of four public institutions is quite challenging. Each institution has different working methods, values, and they may also have different objectives. It has also proven difficult to engage all of the regional institutions and business consultants in the program, and there has been a large variation in the degree of activity. Furthermore, the skill of consultants varies significantly; this is important to realize, as the success of the program to a large degree depends on the quality of the consultants who approach the firms.

The current focus in developing the program is on further building buy-in throughout the participating institutions, spreading joint best practices, and thus evening out regional differences. Efforts are also being made to approach also companies that do not belong to the natural group of clients of the four participating institutions; these include e.g. more traditional mature companies that have a renewed motivation to grow. In the future, the concept could be further developed to cover not only financing for R&D/technology which is the current focus, but also e.g. marketing/sales and other needs of firms.

In all, the measure is quite original in that it acts as an interface to all the services of major public support institutions and is proactive in finding high-growth potentials and directing these firms to the appropriate services. The practice can thus be recommended in cases where there is a network of disparate public organizations offering support services to firms.

### 5.1.3.2 INTRO

www.preseed.fi

The INTRO program was started in 2002 by Sitra, the Finnish National Fund for Research and Development. This very successful program seeks to correct a perceived market inefficiency in the financing of early-stage ventures by functioning as an interface between entrepreneurs and private investors (business angels). The program offers an online marketplace and a trade-show for business ideas that are available to private investors, advice on business plans, and courses and workshops in private equity investments for both entrepreneurs and investors.

**Description**

The main purpose of the program is to facilitate contacts between investors (primarily business angels) and entrepreneurs. This is realized through a contact forum online and tradeshows where young firms and new entrepreneurs can present their business ideas to potential financial backers. All entrepreneurs and investors are required to sign non-disclosure agreements. In order to participate, potential investors must be classified as 'professional investors'. The program also provides training in e.g. early-stage financing, contracting, and valuation for entrepreneurs and investors.

In addition to facilitating contacts between investors and entrepreneurs, the program can also co-invest with business angels in firms to up to 50% of the total investment. When needed, the program can also support the formation of syndicates between several private and public investors.

One aim of the program is to promote the investment readiness of early-stage businesses and facilitate their access to early financing rounds. The program also seeks to promote the development of a private venture capital and business angel market in Finland. A secondary goal is to reduce the cyclicality of the venture funding market.

The program supports growth-oriented firms in knowledge-based sectors, including technology-based sectors and professional services. Participating firms are typically in

the seed or start-up stage. Some early-growth stage companies have also participated, but a criterion is that the firms have not yet received external funding.

The program was started in 2002 and is run and funded by the Finnish National Fund for Research and Development (Sitra). The budget for the program is 1,2 MEUR for coordination, and in addition, the fund invests 1 MEUR annually in start-ups. This funding is matched annually by approximately 4 MEUR of private investments.

**Results and Lessons Learned**

So far, 150 firms have participated in the program, of which 30% have raised funding. Last year, 40 firms participated in the program, and 14 of these firms received financing. On average, the firms raise an average of 350.000 EUR. This equity investment is typically supplemented with public capital loans and research grants, bringing the typical total financing up to approximately 1 MEUR per firm.

In total, 300 business angels participate in the program. Of these, about 200 participate actively in screening deals. As a group, the business angels have declared that they are prepared to invest up to 40 MEUR in young firms.

The program is considered very successful. One measure of success is that 5 participating companies have raised over 10 MEUR in subsequent private financing rounds. One example is the mobile game software firm Sumea Interactive.

One success factor has been a relatively high degree of selectivity in the program. Only 40 companies are chosen annually for the program. The program estimates that this number represents virtually all new ventures that may be attractive to business angels as high-growth potentials in Finland. The program has recognized that the most promising entrepreneurs and the most promising business ideas tend to get access to venture financing right away without the help of the support program. Nevertheless, there is a need for a program for the high-growth potentials that are "just below" the star firms, and these may be appropriately funded by business angels.

Furthermore, the program has recognized that it is not enough to get just any financing; firms need enough financing to realistically enable growth in the markets they target. Therefore, the goal of the program is to raise at least 300.000 to 500.000 EUR per firm.

The program considers private investment by business angels as superior to public funding of young firms. Business angels have been recognized as more effective in

screening and picking the firms that have the highest potential for growth. In addition to contributing capital, business angels also often have much to contribute to young firms in terms of business knowledge. The program also suggests that there exists no "financing gap" of early-stage firms as long as the firms are of high enough quality. This is illustrated by the fact that for 80% of the deals that the program brokers, the business angels contribute all of the capital. In only 20% of the deals, a syndicate between business angels and public investments is needed in order to raise enough equity financing.

The program has also recognized the importance of being quick, flexible, and relatively independent in its decision-making. This is accentuated by the fact that the time-to-market is critical in many of the targeted sectors, and firms therefore need to access funding quickly in order to achieve success. Furthermore, all employees involved in the execution of the program have been recruited from industry. As a result, they have a good understanding of what both firms and investors require in terms of finding mutually agreeable deals.

Another lesson learned is the need to train both entrepreneurs and business angels in early-stage financing and valuation. The program initially focused on training entrepreneurs, but due to the complexity of many private equity investments, also business angels require training in order to fund new start-ups. In the program, entrepreneurs and investors attend the same training sessions, which facilitates the formation of mutual understanding and standards.

Business angels have also, contrary to conventional wisdom, been found to not be home-biased. Therefore, there has been no need to divide markets regionally. On the contrary, the program sees a future with Nordic/Baltic cooperation around early-stage financing.

While the program is seen as ongoing, consolidation with other support measures is expected in the future. A further development of INTRO itself would be to introduce an early-stage firm merger service.

#### 5.1.3.3 Research into Business (TULI)

www.tuli.info

The Research into Business (TULI) program was started in 2002 by Tekes, the National Technology Agency in Finland. The program provides grants of up 10.000 EUR to

researchers and research teams for obtaining private sector advice and consultancy services on the commercialization prospects of their research. The program has recently been extended to a second 4-year period and is considered successful.

**Description**

The Research into Business program is a competitive program that provides grants to researchers and research teams for the evaluation of the commercialization potential of their research. A grant of maximum 10.000 EUR is provided to cover the full costs for private-sector experts' advice on various issues related to the commercialization (legal advice, market analysis, IP, financing, creation of business plan, etc) of a research result or an innovation. Support cannot be used towards the researchers' own salaries.

The grants target publicly financed research; in practice, most applicants are from universities of technology or industrial design. Potential researchers and teams are pro-actively identified by the universities' technology officers, who then broker the grant to the teams.

The aim of the program is to promote the commercialization of research through licensing and the creation of new firms. All technology-based sectors are eligible for support.

The program has been extended and is currently funded for a 4-year period. For this second phase of the program, a regional operational model has been implemented to ensure improved flexibility and speed. The implementation of the program is carried out via 16 technology centers by Tekel, the Finnish Science Park Association.

The program is financed by Tekes, the National Technology Agency in Finland, and the annual budget of the program is 2,7 MEUR.

**Results and lessons learned**

So far, 1201 projects have been supported through the program out of 2299 proposals. Last year, 389 projects were supported out of 670 proposals.

The program is generally considered successful. Out of the 1201 supported projects, 112 firms have been created and over 70 technologies have been licensed. This corresponds to a hit rate of about 15%, which must be considered in relation to the very early stage of the supported projects. The supported technologies are often new and their commercialization potential is thus very uncertain. Growth rates for the created firms

are not available; nevertheless, the optimal outcome for a supported project is clearly to result in the creation of a firm, since there is very little value for the researchers in license deals. The longer-term effects of the program are difficult to evaluate.

The strengths of the program have been the flexibility and speed of operation, the low overhead and bureaucracy in the organization, and the brokered use of private sector experts for providing advice. The program has also benefited from the network of cooperation between the universities' technology officers and the regional science parks.

One of the perceived weaknesses of the program has been a low level of funding which limits the usefulness of the provided grants. Another problem has been to find enough knowledgeable private-sector consultants that are able to support the researchers. Furthermore, the program may be too focused on the earliest stage of the commercialization process, while leaving a gap between the activities supported by the program (such as making the commercialization plan of the research result) and actually bringing new innovative products or services to market.

## 5.1.4 Hong Kong

### 5.1.4.1 Hong Kong Applied Science and Technology Research Institute (ASTRI)

www.astri.org

The Applied Science and Technology Research Institute was founded by the Innovation Technology Commission of the Hong Kong Government in 2000. The institute supports technological innovation in Hong Kong and stimulates spin-offs by conducting 'mid-stream R&D' in 5 select technological fields.

**Description**

ASTRI conducts R&D with the aim of commercializing new technologies. The institute currently focuses on five research areas: photonic technologies, integrated circuit design, Internet software, wireless communications, and biotechnology. ASTRI currently employs 250 researchers, and the number of researchers is expected to grow to 800 within a few years. While the institute is primarily funded by the government, it cooperates with private firms in the select industries in order to commercialize technologies through licensing.

ASTRI has been explicitly set up to do 'midstream R&D', i.e. be a link for technology transfer from basic research carried out at universities to commercialization in the local

industry. Through its R&D activities, the institute strives to elevate the technological level of industry in Hong Kong, and, by encouraging spin-offs, function as a spawning ground for technology entrepreneurs. By directly involving industry in the R&D process and in licensing the results, ASTRI strives to conduct research that has a high degree of customer-focus and applicability in industry.

Other goals of ASTRI include enhancing Hong Kong's technological human resource level and functioning as a focal point for attracting outside R&D personnel to work in Hong Kong; researchers at ASTRI with knowledge in a specific technology domain are expected to eventually transfer to industry.

The annual budget for the institute is 9,5 MEUR.

**Results and Lessons Learned**

Previously, ASTRI focused on incubating and spinning off start-ups with the support of venture capitalists. However, the mode of operation has since changed towards being a R&D institute involving industry participants. This change was called for since the institute did not want to compete with the incumbent firms in the market through its own start-ups.

Under the new model, which has been in operation since 2004, the focus is on developing new technologies and supporting the commercialization of these technologies through licensing agreements. The institute under this model has generally been considered successful. For example, 15 technology licenses have been transferred to industry; mainly technologies related to photonics. The target is to reach 100+ licensing deals per year.

ASTRI is quite similar to the Cooperative Research Centres program in Australia in that it brings together researchers from various public institutions and collaborates with private firms in order to target innovation in a number of select industries. Nevertheless, although the institute enhances the technological level in Hong Kong, the link between the ASTRI program and small firm growth is hard to explicate. For example, there have hardly been any spin-offs created as a result of the new technologies. Furthermore, the model of operation to carry out 'midstream R&D' assumes a linear model of innovation. There is also a danger that public research in these technologies only substitutes private investment in R&D. Finally, the program has considered it important to carefully

balance the issues of public accountability and public management in order not to stifle the program through over-bureaucratization.

Although the institute has strived towards cooperating with universities, this cooperation has not met expectations. One suggested explanation for this lack of cooperation has been that ASTRI's research focus is on application, and universities have few incentives to conduct applied research since their funding is based on doing basic research and training students. Nevertheless, ASTRI illustrates the importance of concentrating efforts around select sectors in order to create a critical mass of R&D in these technologies.

### 5.1.4.2 Hong Kong Science & Technology Parks (HKSTP)

www.hkstp.org

The Hong Kong Science and Technology Parks (HKSTP) is a result of mergers between several incubation centers and technology parks in Hong Kong. HKSTP in its current form was founded in 2001 and is sponsored by the Hong Kong government. The program has been successful in combining incubation and technology park facilities and thus promoting clusters with both young and established firms around several technologies.

**Description**

HKSTP is run as a government-owned corporation, which manages an incubation centre and a science park. There are currently 216 tenants in the science park and 90 in the incubation center. The industries represented include electronics, biotechnology, precision engineering, and information and communications technology. While the incubation center targets firms in the start-up and early growth phases, the science park caters to firms that are already in the expansion or maturity stages of development. In addition to infrastructure and facilities, HKSTP also offers management, marketing, and consultancy services to tenants.

HKSTP is funded mainly through rents and other income; nevertheless, HKSTP incurred an operational loss of 4 MEUR in 2004.

**Results and Lessons Learned**

HKSTP has been successful in supporting the growth of young firms and in promoting clusters of technology firms. Of the incubatees, about 10-15% tend to do quite well. Nevertheless, very few high growth firms have emerged from the incubation program;

out of 201 companies listed on the Hong Kong Growth Enterprise Market (GEM), only 3 are graduates of the predecessors of HKSTP: the HKITCC and the Incu-Tech programs.

What the HKSTP seems to do well is that it co-locates both young and more mature companies by providing both incubation facilities as well as facilities for mature firms (e.g. Philips is one of the more recent new tenants). HKSTP is currently also expanding its facilities to be able to house more tenants.

A lesson learned during the course of the program is that all services must be charged for appropriately or they will be abused by the housed firms. In addition, the incubatees should be monitored in order to ensure that they continue to perform well.

The HKSTP is almost self-sustaining, and so it may be considered an efficient use of governmental funds. However, HKSTP has suffered from management problems. The most visible symptom is a frequent change of top management; within the last 5 years, there have been 3 CEOs for HKSTP. The changes in management may be an indication of other underlying problems, for example over-bureaucratization.

## 5.1.5 Hungary

### 5.1.5.1 Corvinus International Investment

www.corvinusen.siteset.hu

The Corvinus International Investment program was started in 1997 and was taken over in 2005 by the Hungarian Development Bank. This program primarily provides funding for Hungarian firms that wish to expand internationally. The program is considered very successful.

**Description**

Corvinus International Investment provides funding for co-investments with Hungarian companies abroad. Corvinus can either co-invest in Hungarian firms' subsidiaries abroad, assist Hungarian firms to develop appropriate business strategies in order to facilitate access into international markets, and contribute capital towards investments that enhance the competitiveness of these firms. The aim of the investments is to facilitate foreign direct investments by Hungarian companies, and thus promote the creation, acquisition, and development of venture abroad.

The funding is provided primarily in the form of equity investments, but also loans or guarantees may be available. Prior to making the investment decision, the program may also assist the applicant firms in developing their business plans.

The fund addresses innovative high-growth SMEs that already have a registered patent. The fund helps these firms to bring these innovations to market and alleviate the problem of a lack of venture capital supply that many of these firms face.

The maximum investment in each firm is around 1 MEUR, for a stake representing 10 to 49 per cent of the firm. The planned duration of the investment is up to 10 years. The fund seeks to be self-sustaining and only finances "economically feasible projects" at "market conditions".

A total of 6,8 MEUR is planned to be invested this year. The fund employs 7 staff.

**Results and Lessons Learned**

In 2005, the fund received 50 applications for funding. Of these, 12 business plans have been developed further, and 7 projects have been approved for funding. In the future, the fund expects to finance 8-10 projects per annum.

The program has been regarded as very successful, since it fills a gap in the funding of firms that want to expand internationally. Venture capital has been almost completely absent in the Hungarian economy, stifling the pace of innovation and new firm creation.

A selection criterion of the program is that the supported firms must have a patent-protected technology. The program does not provide funding for pre-patent R&D or for the patenting process.

While the fund initially concentrated on the biotechnology sector, it is now open to firms in all sectors and industries and may thus have a larger reach.

### 5.1.5.2 Information Technology Venture Capital Fund

www.rfh-rt.hu

The Information Technology Venture Capital Fund is a venture capital fund for investments in ICT firms. It was founded in 2002 by Regional Development Holding, a state-owned company. The program has been successful in filling a financing gap for young technology-based companies and in encouraging the expansion of these firms.

**Description**

The Information Technology Venture Capital Fund provides VC capital for equity stakes in firms in the ICT sector. The fund explicitly targets ICT firms in the start-up or early growth stages of development which have a high potential for growth. While the fund primarily provides capital, it also can offer limited management assistance to the supported firms.

When making the investment decision, the fund prioritizes investments that may create employment, improve technology infrastructure, or create export opportunities. The fund is profit-oriented and state-owned through Regional Development Holding.

Since 2002, 10,7 MEUR has been invested. The fund employs 4 staff.

**Results and Lessons Learned**

In 2004 and 2005, there have been a total of 40 applicant firms, of which 8 have been supported (4 per annum).

The program has been regarded as successful in providing capital for high-growth firms. A success story is game software development firm Stormregion Ltd. Nevertheless, the fund has a strong regional development focus which may conflict with the aim of finding the highest potential firms.

Another interesting aspect is that Hungary has considered two venture capital programs to be the most successful measures for supporting high-growth firms in the country. This can be an indication of that the supply of capital, especially in early-stage investment, may be scarcer in Hungary than in other more economically developed countries.

### 5.1.5.3 VIVACE program of the Hungary Patent Office

www.hpo.hu/English/

The VIVACE program was founded in 2004 by the Hungary Patent Office and is funded by the Hungarian government. The program offers mentoring and advice on patenting and intellectual property, and it has been considered successful in raising the patenting rate of SMEs.

**Description**

The VIVACE program provides mentoring and advice by IP experts on patenting for SMEs. The advisory services include information on e.g. patents, supplementary protection certificates, utility models, trademarks, geographical indicators, designs, and

copyrights. The program also provides a telephone help-line on IP protection, education schemes in intellectual property for attorneys and other courses, an e-learning package, and conducts promotional activities for patenting.

The goal of the VIVACE program is to heighten the awareness of the intellectual property system SMEs and develop an "IP culture" among firms in any life cycle stage. In so doing, the program seeks to alleviate a perceived growth bottleneck caused by inadequate protection of intellectual rights.

The program is targeted at all SMEs in all sectors. Nevertheless, a focus on the technology sector is implicit.

The program was founded in 2004 is administered by the Hungarian Patent Office and funded by the government. The annual budget for the program is 419.000 EUR, and it employs 5 staff.

**Results and Lessons Learned**

So far, 1500 firms have been assisted through the program. Last year, 500 firms were supported.

The program is generally regarded as successful. The program has increased the patenting rate among SMEs, which is important as patents are considered increasingly critical for the growth of technology-based SMEs. For example, with protected intellectual property, SMEs and entrepreneurs can more easily obtain venture capital or business angel funding.

The program has also been successful in increasing the awareness among SMEs about the rights that are possible to obtain through intellectual property. An expected goal for the program is also to increase the technology licensing activity among SMEs. Nevertheless, while patenting is seen as an important driver of innovation and competitiveness for SMEs, the direct influence of the program on growth has been difficult to measure.

A lesson learned has been that although the Hungarian patent activity has dropped since the 1980s, it is possible to positively influence the patenting trend through directed measures.

## 5.1.6 Italy

### 5.1.6.1 I3P (Incubator of the Turin Politecnico)

www.i3p.it

The I3P incubator was started at the Torino Politecnico in 1999. It is co-financed between 6 partner institutions. The program is a successful example of a university-affiliated incubator based on broad regional cooperation.

**Description**

The incubator is linked to the Torino Politecnico and targeted at students, recent graduates, and employees of the university. I3P was the first incubator in Italy linked to a university. The incubator provides infrastructure in terms of offices, seed capital through an affiliated VC fund, professional business services, as well as visibility for its tenants. The physical space consists of offices in the Torino Politecnico and the business services are offered at a subsidized price. The incubator also organizes a 'Start Cup', i.e. a business plan competition.

The incubator is targeted at 'knowledge-based firms', which are in practice technology firms with an emphasis on ICT. The incubator upholds a high degree of selectivity for the incoming firms. Approximately 10% of all applicants will eventually enter the incubator. Incoming firms must demonstrate an ability to develop knowledge-based projects and need to be less than one year old, i.e. in the start-up stage. The firms can stay in the incubator for up to 3 years.

The funding of the incubator is shared equally between six public or non-profit institutions: Politecnico di Torino, Provincia di Torino, Camera di Commercio di Torino, Finpiemonte, Comune di Torino and Fondazione Torino Wireless. The seed capital is provided through the Piemontech VC fund, which is part of Fondazione Torino Wireless.

**Results and Lessons Learned**

So far, 69 firms have been housed in the incubator, and 8 new incubatees are expected in 2006. As of May 2006, there were 36 firms in the incubator. In addition, 18 projects have been offered training and mentoring as part of a 'pre-incubator program' lasting 3-6 months.

The incubator is regarded as successful. In 2004, it received the "Best Science-Based Incubator Award" by the Dutch Science Alliance organization. The incubator has spawned many new firms with an exceptional survival rate in the technological sector: out of the 50 firms that were created in the period 2000-2005, only 4 have gone out of business. One may wonder if this survival rate may even be too high, given that high-growth ventures also typically are highly volatile. In total, the firms have created 220 new jobs and have a combined annual turnover of 8 MEUR.

The key strengths of the program have been the closeness to the university as well as the high selectivity of the program, which may be one reason behind the high survival rate for the firms. The program is also a good example of broad cooperation between various regional institutions.

### 5.1.6.2 Piemontech VC Fund

www.piemontech.it

The Piemontech VC fund was started in 2004 to support ICT start-ups in the Piedmont region. The fund provides capital of up to 200.000 EUR for start-up funding. Fondazione Torino Wireless, a publicly funded foundation, is the principal institution behind the fund and the fund is also associated with the I3P incubator. The fund applies strict criteria for financing and the program has so far been considered successful.

**Description**

Piemontech is a small venture capital fund, which invests between 20.000 and 200.000 EUR for a 20-35% equity stake in start-up companies in Piedmont. The fund also provides advice and consulting support, e.g. regarding strategy formulation, new customer identification, and human resource management. The aim of the fund is to promote innovation and foster growth and development in the high technology industry in Piedmont while generating acceptable financial returns to the fund.

The Piemontech fund concentrates its funding and non-financial efforts selectively on a relatively small number of firms. The fund targets innovative start-ups and young firms in the technology sector; mainly ICT, but also to some degree biotechnology, advanced mechanics, and high-value added services. In order to obtain funding, firms must have a high growth potential and aim at international markets. Investments are expected to typically last 4-5 years.

The fund is associated with the I3P incubation centre and operated by Fondazione Torino Wireless, a publicly funded foundation, which owns around 50% of the fund. Many other partner foundations and firms own minority shares and participate in the management of the fund, including the I3P incubation centre, Eurofidi, and Unione Industriali di Torino.

The annual budget is 2,5 MEUR, and this is expected to increase to 5 MEUR in the next year and a half. Two full time staff work with administration, while the fund involves its network partners for evaluating proposals.

**Results and Lessons Learned**

So far, the fund has made 12 investments out of 600 proposals. This implies a 2% funding ratio, which is quite similar to that of private VC funds. The goal is to grow the portfolio to 40-50 firms in total.

The fund has been regarded as successful in enabling firm growth through the capital it provides.

Although it is too early to evaluate the growth rates of the funded firms since the first investments were made 1,5 years ago, there are many positive signs. Out of the 8 first funded firms, 6 have transitioned from the R&D stage and are now generating revenues, and none of the funded firms have gone out of business. There have also been negotiations about second-round financing with some firms, which is another positive signal.

Another sign of the success of Piemontech is an increasing number of applications and an increased interest among entrepreneurs who apply to the fund. This goes hand-in-hand with a growing general awareness of VC funding in Italy and the Piedmont region. Entrepreneurs who apply to the fund appear to be better trained and prepared when they approach VC funds than they were 1,5 years ago, which also indicates an improvement in the quality of demand for venture capital.

Compared to many other public policies in Italy, which fund a larger part of the applicants, Piemontech can apply stricter criteria and thus uphold a higher quality level among the funded firms. This ensures that the resources of the fund are spent effectively on firms that have a clear growth strategy and target international markets, and the fund should thus realize greater returns.

Another key to success has been the network of public and private partners cooperating around the fund. Although Piemontech is a relatively small fund, the network around the fund is continuously growing, e.g. in terms of universities and research centers from which the fund receives proposals.

## 5.1.7 Netherlands

### 5.1.7.1 Mastering Growth Program

No website

The Mastering Growth Program is one of quite few programs that focus on the initiation and management of growth from a managerial perspective. This program was started in 2006 and is financed by the Ministry of Economic Affairs. The program arranges training events for entrepreneurs who have growth expectations.

**Description**

The program supports "master-classes", in which ambitious entrepreneurs who manage growing companies learn from each other (through interactive case studies and experience sharing) about how to achieve high growth, e.g. in terms of funding, human resource management, strategic planning, and growth management. These workshops provide an opportunity for entrepreneurs to share notes and ideas, and the workshops are combined with tailored lectures on growth. The classes are run by the management academy De Baak and the national innovation agency Syntens.

The goal of the program is to improve both the motivation to grow as well as the management skills of the participants. The classes are aimed at leaders of firms of all sizes and in all stages of development, but the common denominator is that the entrepreneur should be ambitious and aim for growth. The courses are carried out in 4 different regions, and there are four different modules that target firms of different sizes: start-up (<15 employees); moderate growth (15-35 employees); fast growth (> 35 employees); and large firms (>250 employees). The program focuses specifically on a few select sectors, including human health, agriculture and food, manufacturing, logistics, construction, and creative industries

Each participant is charged 3.000 EUR for participation in the program, and the courses are further subsidized by the Ministry of Economic Affairs. The budget for the co-financing is 250.000 EUR.

**Results and Lessons Learned**

Although the program has just started, high expectations are attached to the program. An innovative aspect of the program is that the participants primarily learn from one another. The program thus seeks to facilitate sharing of tacit skills and experiences, which is often overlooked in formal training programs. The program divides entrepreneurs that manage firms of different sizes and growth prospects into different groups, as each group is expected to have somewhat different needs and face different growth constraints. The program expects 10-15 firms to participate in each of the 4 modules in every region, i.e., a total of approximately 200 firms in the country as a whole.

To a larger degree than many other programs, this program aims to improve the skill level and motivation of the entrepreneurs. It could be argued that more programs could benefit from focusing on the motivation and the sense of self-efficacy of the entrepreneurs instead of focusing on firm-level resources, since it is mainly the entrepreneur who is responsible for initiating and maintaining a growth process in the firm.

### 5.1.7.2 TechnoPartner Program

www.technopartner.nl

The TechnoPartner program was started in 2004 as a joint initiative between the Dutch Ministry of Economic Affairs and the Ministry of Education, Culture, and Science. The program is a result of merging and substituting a number of earlier support initiatives into one, comprehensive program. The program attempts to increase both the supply and demand of venture capital, and it has been regarded as very successful.

**Description**

The TechnoPartner program is a comprehensive program which seeks to promote access to venture capital and business angels for technology-based firms. The program consists of four subprograms, each contributing to this end:

1. Knowledge Exploitation funding program - Provides grants for research commercialization, such as help with patents and pre-seed financing for researchers.
2. Seed facility – Provides a subsidized loan to venture capital funds for co-investments in early stage firms, which improves the risk-return ratio for these funds.
3. Certificate - Assesses the business outlook for young firms and may award a certificate for the firm combined with a loan guarantee of 80% for up to 100.000

EUR loans to firms that qualify for the certificate. The program thus reduces the risk for banks that finance these SMEs.

4. Business Angel Program – Upholds an information service for 'virgin angels', for example, on contracting and monitoring rights. Virgin angels are potential new business angels that want to invest in young SMEs.

The program is thus targeted at promoting the supply of early-stage capital, whether through public grants, banks, business angels or venture capital funds. The budget for all of the four subprograms is a total of 85 MEUR over 4 years. 6-7 staff are directly working with the program.

**Results and Lessons Learned**

In 2005, 7 venture capital funds (out of 14 applicants) were supported through the seed facility. Similarly, seven research ideas were sponsored through the Knowledge Exploitation program. A total of 23 firms were certified for loan guarantees.

The major advantage of the program is that it takes a multi-angle view on promoting financing for technology-based SMEs, and seeks to promote investments in start-ups by both business angels, banks, as well as venture capital funds. For the earliest stage ideas (research commercialization), the only appropriate mode of financing is considered to be public grants, since the risk-return ratio in these types of investments is the least attractive for private investors.

## 5.1.8 Spain

### 5.1.8.1 Contest of Ideas for the Creation of Technological or Science-Based Industries

www.parquecientifico.uc3m.es/emprende/

This contest is a competition for technology-based business ideas in the Madrid region. The competition is targeted mainly at young university students. The initiative was started by the University Carlos III and Technological Park of Leganés in 2004.

**Description**

The contest consists of an annual competition for technology- or science-based business ideas. The aim of the contest is to promote innovative business concepts and young entrepreneurs in Madrid and encourage the commercialization of R&D.

The prizes for the winning concepts consist of three components. First, there is a money prize for the top four concepts. Second, the top concepts will be offered the incubation services of the Leganés Technological Park for free for 6 months, including

supplementary services such as training, legal consulting, tax assessment, administration, and access to financial channels. Third, the top concepts will gain visibility through media coverage.

The competition is mainly addressed at university and MBA students in their final year. The program targets the seed stage of forming a new business venture, and there is an explicit focus on business concepts in the technology sector.

University Carlos III and the Technological Park of Leganés arrange the competition, and the competition involves around 20 part-time staff. The yearly monetary prizes total 30.000 EUR, of which the number one concept receives 12.000 EUR.

**Results and Lessons Learned**

Between 2-4 business ideas are promoted annually in the competition. Thus far, 12 business ideas have been promoted. Some new firms have been created based on these ideas, and the program is generally considered very successful. However, there exists very limited data on the growth of these firms.

Also the externalities of the initiative are deemed to be significant. Most important is the degree to which the competition can raise the awareness of and interest in an entrepreneurial career. These effects have been considered very important in Spain, as very few young people in Spain seem interested in an entrepreneurial career.

### 5.1.8.2 Embryo Project - Program for University Entrepreneurs

http://observatorio.umh.es/embryo

The Embryo Project is a program started in 2000 by the University Miguel Hernandez. The program seeks to encourage students to become entrepreneurs, by providing courses on entrepreneurship, mentoring, and seed financing. The program is co-financed by the European Commission.

**Description**

The Embryo project provides training, advice, and access to entrepreneur networks for potential technology entrepreneurs at the University Miguel Hernandez. The university provides both the infrastructure needed to develop an "Embryo firm" as well as courses and counseling in business skills for students and researchers.

The program focuses on three issues: (1) identification of entrepreneurs with a university background; (2) promotion and development of their entrepreneurial skills;

and (3) development of a local expert infrastructure for new technology ventures. The program takes an integrative view on entrepreneurship and tries to address a range of aspects from opportunity identification and motivation to issues of monitoring and control once a firm has been set up.

The program has been in effect since 2000 at the University Miguel Hernandez de Elche and is financed mainly by the European Commission. There are two full time employees involved in managing the program.

**Results and Lessons Learned**

Since its inception, the program has spawned 74 (in 2005: 14) start-ups and 4 (1) spin-offs. The start-up firms have in turn created 150 new jobs. There are 7412 students enrolled in an entrepreneurial club at the university, and the program has had 1068 participants in its motivation and training activities.

The program is regarded as very successful. It has spawned new entrepreneurs, increased their motivation to grow, and improved their skill level. What sets this measure apart from many other measures is that it focuses on the individual level by identifying and motivating potential future entrepreneurs.

One lesson learned is the importance of developing a local network of partners in the form of experts, mentors, and partner firms. By doing so, the impact of the program can be leveraged in a cost-efficient way. The program has also recognized the importance of gaining the acceptance of the university board to develop the program to suit the needs of entrepreneurs and network partners.

### 5.1.8.3 Prestecs Participatius del CIDEM - Participative Loans

www.cidem.com/cidem/cat/actualitat/noticies/2006/03/306prstecscapitalconcepte.jsp

Prestecs Participatius del CIDEM is a new public venture capital fund for young firms and spin-offs in Catalonia. The fund is a collaborative effort between six universities. It is funded by the Catalonia Investment Promotion Agency. The fund offers seed-stage loans and start-up equity investments.

**Description**

The venture capital fund offers two types of financing for the seed, start-up, and early growth stages for technology-based firms. First, firms can be granted a so-called 'concept capital' of up to 100.000 EUR as a subsidized participative loan. Second, firms

can get seed capital of up to 300.000 EUR as an equity stake in the firm in order to accelerate growth during the early growth stage. The program can also refer firms to venture capitalists for additional funding.

The target group of firms consists of high-growth start-ups in the technology sector. There is a maximum age limit of 2 years for the participating firms.

Six universities in Catalonia cooperate around the venture capital fund. The main part of the capital comes from the public Catalonia Investment Promotion Agency. The annual budget of the fund is 2,6 MEUR, and the program involves more than 25 staff.

**Results and Lessons Learned**

As of May 2006, 3 firms had been funded. The expectation for the full year is that 26 firms will receive funding. It may be too early to evaluate the success of the program; nevertheless, the expectations are high. A supported company that already has experienced growth is Activery Biotech.

The fund represents a good example of cooperation between universities, government agencies, and entrepreneurs. As such it may also give participating universities an incentive to further encourage entrepreneurship and promote commercialization of research.

## 5.1.9 United Kingdom

### 5.1.9.1 Gateway2Investment (g2i)

www.g2i.org

The Gateway2Investment (g2i) program was started in London in 2005. The program helps innovative firms become "investment-ready" through a three-stage program that involves self-assessment, training, and mentoring. All 42 universities in London participate in this very successful program which is administered by Grant Thornton and financed by the London Development Agency.

**Description**

The program provides help and assistance to innovative firms to become investment-ready. The program consists of three stages, where after each step some of the firms are selected for more comprehensive support. The program starts with entrepreneurs making a self-evaluation of their firms' investment-readiness. This self-evaluation is aided by the diagnostic software package Gauntlet. Later-stage support is provided

through individual and group workshop sessions as well as through mentoring sessions where e.g. investment propositions and business plans are developed. No grants are provided, but the aim of the program is to aid participating companies to become viable and attractive investment opportunities for private investors.

The program targets firms in the technology sector (e.g. biotech, ICT, energy, environmental technologies), which have passed the seed stage and are looking for investors to finance growth. Typically, companies that participate in the program are not new. The goal of the program is that each firm would be expected to raise financing of at least 800.000 EUR within a 12-month period.

The program is a 3-year project which is principally financed by the London Development Agency. The financial advisory firm Grant Thornton is the lead delivery partner and thus in charge of the day-to-day execution of the program. Private-sector partners provide advisory services and software at a discounted price or for free, which reduces costs.

The budget for the 3-year period from 2005 to 2008 is approximately 2 MEUR in total. There are 2,5 core staff members at Grant Thornton who are working exclusively on g2i, and around 20 others are drafted when needed.

**Results and Lessons Learned**

So far, 169 companies have received at least 2 hours of support while a smaller number of firms have received more intensive support. 13 companies have raised outside capital, 10 MEUR in total (between 0,2-2 MEUR per firm); the target for the program is to raise 50 MEUR for the participant firms by 2008. Thus far, the participating firms have created 117 new jobs.

The program is considered very successful. It has a proven success of promoting VC financing for firms. As there are new big investments currently in the pipeline, the program expects that it will meet its targets.

The program has recognized that a lack of financing supply is not a problem in London, but rather the knowledge and skills about how to access the finance is the bottleneck. By acting as a gateway for firms to access financing, the program thus represents a good example of how to improve demand for venture capital in an area where fewer or no measures are needed to improve the supply side. This philosophy is similar to that of the INTRO program in Finland, which is also built around the idea that there is no

supply-side financing gap, but that the cause of the scarcity of early-stage investments is on the demand side as entrepreneurs are not aware of how to turn their firms into attractive investments.

Another lesson learned is the importance of managing the participating firms' expectations concerning the firms' journey through the program. A related lesson is the importance of making sure that programs are fully thought through and robust at the time of launch in order to generate goodwill and momentum.

#### 5.1.9.2 High-growth Start-up

www.yorkshire-forward.com

High-growth Start-up is regional project (Phase 1: 2001-2004; Phase 2: 2004-2009) started by the Business Link organization in South Yorkshire in 2001. The program is co-financed by the EU and the Yorkshire Forward Development Agency. The program provides coaching and mentoring by former entrepreneurs to growth-oriented start-ups in the region. The program is generally considered very successful.

**Description**

The program provides up to 18 months of pre-start and start-up mentoring and coaching support for high-growth start-up firms. A mentor will assist the firm in making a plan for growth, and also broker appropriate professional support for the firm in order to overcome any identified challenges. The mentors are usually experts in the particular business sector and have experience from starting and growing their own businesses.

The program broadly seeks to stimulate the "enterprise culture" by helping to identify and develop business opportunities, supporting businesses that are capable of achieving high levels of growth, and removing barriers to growth for these firms. The goal of the regional program is to make South Yorkshire the best place to start and grow a business in the United Kingdom.

The program is targeted at 'high-growth companies', which are defined as start-up firms that target a turnover of approximately 400.000 EUR by year two. The prioritized sectors are technology (e.g. biotech, advanced manufacturing, environment, and energy technologies) and professional services.

The current second phase of the program will run from 2004 to 2009. Nine private sector organizations based in South Yorkshire have been contracted for the delivery of the support. The program employs 7 staff and the total annual budget is 2,5 MEUR.

The program is co-financed by the Yorkshire Forward Development Agency and the European Regional Development Fund.

**Results and Lessons Learned**

During the first phase of the program (2001-2004), 595 start-ups were supported, and these firms have created a total of 2010 jobs. For the second phase of the program (2004-2009), the target is to support 295 start-ups creating 1744 jobs. Last year, 150 firms were supported.

The South Yorkshire region has historically had a low rate of entrepreneurship, but the program has generally been considered very successful in increasing the number of growing new firms. One success story is the DVD software company ZOOtech.

A reason for the success has been that the program focuses on unblocking progress and providing firms with the managerial skills and insight that they need for growth. Another important success factor is that mentors have personal experience from entrepreneurial activities. In many other programs, business coaches tend to be publicly employed and do not necessarily have previous experience from starting and running a firm.

A lesson learned has been that entrepreneurs need to be shielded from data collection requirements and bureaucracy that often may accompany national and European support programs. The program also must ensure that all interaction with entrepreneurs is timely and based on the client's time and availability and not on the needs of the support organization.

For the development of the project, the program is trying to design and implement a new diagnostic process that allows the program to identify certain entrepreneurial traits that characterize successful projects.

### 5.1.9.3 Mustard.uk.com

www.mustard.uk.com

The Mustard.uk.com program was started in the West Midlands, UK, by the two public organizations Advantage West Midlands and BusinessLink in 2000. The program is co-financed by the EU, and it offers business coaching and subsidized private consultancy services to nascent entrepreneurs and young start-ups. The program has been regarded as very successful.

**Description**

The program refers firms to and subsidizes private consultancy services (e.g. in management consulting, law, accounting) for nascent entrepreneurs and start-up firms. The firms should target a turnover of at least 400.000 EUR in their second year and be willing to locate in the West Midlands region.

In addition to access to subsidized consultancy services, available support includes workshops for start-ups and nascent entrepreneurs, access to a business opportunity database, and mentoring services for young firms through a dedicated business coach. Support is normally provided for up to 18 months, but can be extended for up to 36 months.

The program seeks to support the start-up process of new growth-oriented firms by facilitating access to business expertise for entrepreneurs and firms in the seed and start-up stage. While the program is not limited to firms in any specific sectors, the priority sectors are creative industries, food, and tourism.

The program was started in 2000, and it is run by Advantage West Midlands and the Business Link organizations in the West Midlands, and co-financed by the European Regional Development Fund. The budget is 2,6 MEUR per annum, and the program employs 3 full time staff in the central management team and 15 managers working as business coaches across the region, plus contracted private sector consultants.

**Results and Lessons Learned**

Since the inception of the program, approximately 2000 firms have been supported. Last year, 300 firms were supported. The current average size of the companies that have participated in the program is 8 employees and 650.000 EUR in turnover. Some star companies have grown to over 100 employees.

The program is generally considered very successful. The reasons for success have been a clear and independent brand identity for the program, a focus on nascent entrepreneurs who are currently in employment, a co-pay system for the services, and a strict quality control of the private sector partners.

A brand identity is especially important since many entrepreneurs in the target audience have traditionally had a skeptical or even negative perception of government support programs. It is thus of great importance to let the program be quite independent from

government and have a high degree of interaction private sector partners such as banks, financial advisors and consultants who are well respected by the target audience.

Another important insight is that potential high-growth entrepreneurs may often be employed, and they will therefore need support and guidance on their career change path to self-employment. Having a co-pay system for the subsidized services challenges and motivates the clients.

Finally, only private sector partners that have passed a quality assurance process are involved in the program. This ensures that the clients get value for their money and time investment in the program.

A lesson learned has been the importance of looking at the needs of each individual business and entrepreneur and tailor the support for that business. This involves packaging the right solutions, with the right consultant and appropriate coaching. There is no one-size-fits-all for supporting new growth-oriented firms.

#### 5.1.9.4 West Yorkshire Ventures

www.wyventures.co.uk

The West Yorkshire Ventures program was launched by the West Yorkshire Enterprise Partnership organization in 2005; the program is co-financed by the EU. The program provides business coaching for firms with high-growth potential through its own consultants. The program is considered very successful.

**Description**

The program offers business coaching through its own consultants and provides financial support for private-sector professional services based on a diagnostic analysis of the firm's needs. The level of funding for the services depends on the firm's likely level of growth and the type of activities to be undertaken. Advice and coaching is provided for up to 24 months, and financial support for professional services is provided for up to 12 months. The program also arranges training and networking events for entrepreneurs.

In order to be eligible for support, the firm must be an SME based in the West Yorkshire region, which targets a turnover over 1,5 MEUR within 3 years. There is an implicit focus on the start-up and early growth stages of development. The program is open to all sectors, with the exclusion of franchisees, real estate, and professional services.

The program is similar to the High-growth Start-up program in South Yorkshire, with the difference that this program relies to a greater extent on its own consultants for coaching while the South Yorkshire program contracts private-sector consultants for coaching.

The annual budget of the program is 1,78 MEUR, and it is co-financed between the Yorkshire Forward agency and the European Regional Development Fund.

**Results and Lessons Learned**

So far, 566 businesses have been supported through the program. These firms have created 920 jobs.

The program is generally considered very successful in assisting firms to achieve growth. However, the number of jobs created per firm is quite small, or on average less than two per firm. Nevertheless, the program is still new, and it may thus be too early to evaluate the development of supported firms.

A lesson learned is the need for the program to be flexible and adapt to the varying needs of high-growth entrepreneurs and understand entrepreneurs' dislike of bureaucracy. It has also been important to manage intermediaries (i.e. organizations that refer firms to the program) in order achieve a flow of high-caliber clients, and ensure that advisors are competent and thus able to build credibility with clients.

## 5.2 General commonalities of cases

I have used two principal methods when generating the following commonalities of the cases: first, I have scanned the tabular matrix of the 25 measures and looked across rows for patterns, and second, I have read the case descriptions multiple times in order to notice re-occurring themes (Miles and Huberman 1994). After initially recording these patterns and themes, I have re-checked them with the data to ensure that the patterns hold up for a closer review. Second, I have scanned my interview notes and field notes for commonalities and success factors that policy makers and other researchers have suggested, and then looked specifically for these issues in the case descriptions to confirm whether these proposed commonalities also are evident in the data.

A common denominator for almost all of the successful measures listed is that they are quite new. Although some date from the 1990's, the large majority of the measures

listed have been implemented within this decade. This feature is probably due to three main factors. First, the teams may have been inclined to focus their sampling on initiatives that are novel, as novel initiatives are easily perceived (for good reasons) as more innovative. Second, the novelty of the cases may be due to the natural life cycle of policy measures. Policy adjusts continuously, as illustrated by the fact that many of the successful measures are as new as from 2005 or 2006. Thus, except for permanent institutional structures such as export promotion agencies, policy measures tend to have a limited life cycle. In fact, many of the new successful measures have been introduced to replace older measures, and in doing so represent good examples of policy learning. While the newest measures still may not have proven themselves, the expectations for these new measures is high which in turn indicates a high level of ambition among policy makers. Third, the newness of the initiatives reviewed is probably also partly due to an increasing awareness among policy-makers of the importance of high-growth entrepreneurship in general, as well as of the need addressing the special needs of high-growth firms.

However, in spite of recent interest, the initiatives focusing explicitly and exclusively on high-growth firms were surprisingly few. Such focused cases were reported to a larger degree in the more 'mature' policy-making contexts, such as the United Kingdom, the Netherlands, and Finland. For example, we may consider programs such as Finland's Growth Firm Service, the Netherlands' Mastering Growth Program, and United Kingdom's High-Growth Start-Up initiative to represent more 'advanced' policy measures, in the sense that they draw on the experience and learning of several generations of measures. Even so, national contexts differ, so it is not surprising that in Brazil, the emphasis is more on strengthening the technological base of entrepreneurial ventures, and in Hungary there are several programs geared at kicking off the national venture capital industry.

Furthermore, the more successful cases appear to more actively solicit private-sector participation. This is important, because much of the knowledge required to actually solicit and manage rapid organizational growth in entrepreneurial firms is tacit and difficult to simulate (e.g., experience-based knowledge; contacts to key industry players; ability to identify and mobilize key external resources). It is difficult for public-sector operators to develop such knowledge and resources, because their public-sector

mandate effectively prevents them from participating in the day-to-day management of growing ventures.

Finally, it is evident that some of the measures have been founded as a result of available funding from the European Union. While European funding has given good results, policy-makers should be mindful of ensuring sufficient local responsiveness. The most innovative policy initiatives often seem to have been initiated at a local level, and they appear highly tailored to local specific needs (see, e.g., the Red de Pymes Innovadoras of Spain). However, also the European Union funding can give rise to successful, well localized programs, such as the Mustard.uk.com program in the UK.

### 5.2.1 Examples of good practices

The reviewed successful cases of high-growth entrepreneurship display a large range of diversity in terms of their operation and goals, and therefore, it is difficult to identify universal success factors. Nevertheless, the reviewed cases do offer a number of intriguing details and insights, some of which may be applicable also in other contexts. I summarize these below.

From the cases, as well as the preceding literature review, it appears that any initiative seeking to promote rapid entrepreneurial growth must be highly selective when choosing participating firms and individuals - even to the point of exclusivity - since only a minority of all entrepreneurial ventures has the motivation and ability to achieve rapid growth. Many of the reviewed initiatives were indeed selective and apply quite rigorous criteria for qualification. An example is the Piemontech venture capital fund and the I3P incubator in Italy. Compared to other similar measures in Italy which target a larger number of firms, these two measures have proven more successful by focusing their resources on a much smaller portion of firms.

Some successful support measures, such as Finland's Growth Firm Service, proactively approach potential high-growth firms for support. That is, instead of waiting for the firm to approach them, the program actively scans the environment for potential high-growth firms and offers individually developed support packages for these firms. A proactive approach enables the agency to be selective as well as address emerging needs even before these are necessarily perceived by the client firm. A proactive approach is also consistent with the fact that only a small minority of all entrepreneurial ventures are motivated and able to achieve rapid growth.

Another characteristic that seems to characterize some of the successful measures is a relatively high degree of flexibility and independence from government. This independence and flexibility has given the measures room to deal quickly with the ever changing needs of client firms and the demands of the environment. An example of this is the Mustard.uk.com program in the UK, which also claims to benefit from an opportunity to independently build up its own image and thus avoid a type of "PR deficiency" that many public support programs have suffered from in the UK By contrast, in some cases where this independence has been too limited, the result has been frustration and outputs below potential; an example is ASTRI in Hong Kong.

Another related characteristic for successful policy measures is an active participation of private-sector actors. While the majority of programs are largely government-funded, they do not need to be government-run through the government's own agencies. For example, a third party may be contracted for delivering the program or for providing professional services to client firms. This private-sector participation not only serves to introduce experience-based, often tacit skills in instilling and managing rapid organizational growth, but it also serves to enhance the street credibility of the initiative. Examples of privately executed programs include Gateway2Investment in the UK which is delivered by consultancy Grant Thornton, the Growth Firm Service in Finland which is coordinated by the SME foundation PKT, and the Mastering Growth Programme in the Netherlands which is mainly run by management academy De Baak. Programs that actively involve third parties in delivering services include Mustard.uk.com and the Start-up programs in West Yorkshire and South Yorkshire in the UK, while e.g. the EMBRYO project in Spain involves experienced entrepreneurs as mentors.

### 5.2.2 Lessons to be learned

There are a number of notable things we can learn from these cases. First, high-growth firms need to be dealt with flexibly and quickly. Entrepreneurs are short on time and don't want to be standing in line waiting for bureaucratic processes to take their due course. Furthermore, long application lead times may reduce the credibility of support programs and have the counter-productive effect of prolonging the increasingly important time-to-market for the client firm's products and services. Therefore, programs need to have sufficient autonomy to reach their objectives, and be able to address as large a range of needs as possible for the entrepreneur and firm. While it is

clear that entrepreneurs do not want to deal with many separate offices and programs, and equally evident that one measure cannot do everything for all types of entrepreneurs, a suitable organization of programs would be that each support organization would cater to a specific group of entrepreneurs (e.g. nascent entrepreneurs) or firms (e.g. technology start-ups) and through their own targeted portfolio of programs or through referrals to other agencies handle all needs of this target group.

It is also important to effectively make use of networks of both private and public organizations when designing and implementing support measures. By doing this, the measure can benefit from the expertise, reach, and reputation of all the organizations and thus gain a higher visibility and credibility. Network-building seems especially important when implementing regional measures – Piemontech in Piedmont and the Participative Loans program in Catalonia are good examples – but cooperation between a range of public and private partners should be utilized to a higher degree also on the national level. Thus, private-sector participation is important, and the question is usually to find the correct form for it. For example, the private sector can be involved successfully in screening deals (e.g. in INTRO in Finland), providing credibility to the programs (e.g. TechnoPartner Program in the Netherlands), or offering discounted professional services for young firms (e.g. Mustard.uk.com in the UK).

Because the management of organizational growth is very demanding, a major emphasis should be placed on the development and sharing of managerial competencies, based on an interactive approach and the participation of seasoned managers with a deep experience in the management of growth ventures. The skills of managing rapid growth cannot easily be taught without first-hand experience, and getting access to the right resources requires contacts and social capital – assets that are not easily acquired by public-sector organizations.

A related issue is the importance of improving the perception of government support programs generally, as they may often have a poor image in the eyes of entrepreneurs. Steps towards an improved credibility include the need to make programs more independent, flexible, and, as noted above, involve respected private-sector partners that contribute with their expertise. Public programs should also aim to recruit and involve more people from industry, especially former entrepreneurs, in the planning and

execution of the programs in order to ensure that support measures have a thorough understanding of the entrepreneur's other private partners' needs.

A problem in some countries may be that the range of the portfolio of programs is so large that entrepreneurs can have difficulties to assess what services from what institution may be right for them. An example includes the multitude of venture capital funds for start-ups in many countries, e.g. in Finland and Hungary. In addition to increasing the difficulty that clients have in grasping the offered portfolio of support measures, a large number of programs also add to the risk of inefficiencies due to overlaps between measures. Therefore, it may be important to streamline the number of measures, and effectively communicate the role of each measure to potential high-growth entrepreneurs.

## 5.3 Measure categories and themes

Many of the measures used in various countries are very similar. One understandable reason for this is that there exists a relatively high level of interaction between policy makers in different countries, and they exchange through common forums and organizations such as the OECD. Second, the EU through e.g. its regional funds offer co-financing for certain types of measures, which also encourages countries to implement these particular measures.

While the previous section analyzed the 25 most successful measures exclusively, the following sections (5.3 and 5.4) will draw on data for all 47 reported and codified measures. I have chosen to include all measures in this analysis in order to better leverage all the available empirical data for the development of categories of measures and the generation of aggregate finding for which a larger number of measures clearly will yield more complete results.

For the development of categories, I have used an iterative method of ongoing inclusion of groups (Glaser and Strauss 1967). When thus grouping similar measures, I have sequentially examined and assigned all measures to categories based on the measures' description of offered services; consistent with Glaser and Strauss (1967), when a measure could not be included in any of the existing categories I have created a new category. Hence, within each category, measures tend to have similar aims, address firms in similar stages of development, and address similar types of bottlenecks. These categories and associated measures are listed in Table 8.

**Table 8. Categories of high-growth support measures**

| Category | Support measures |
|---|---|
| BA and VC access | • Gateway2Investment (g2i) [UK / London]<br>• INOVAR Venture capital program [Brazil]<br>• INTRO [Finland]<br>• TechnoPartner Programme [Netherlands] |
| Business coaching | • Commercialising Emerging Technologies (COMET) [Australia]<br>• Enterprise Hub [UK / South East]<br>• Growth Firm Service [Finland]<br>• High-growth company support programme [UK / East Midlands]<br>• High Growth Programme [UK / Wales]<br>• High Growth Start-up [UK / South Yorkshire]<br>• Mustard.uk.com [UK / West Midlands]<br>• West Yorkshire Ventures [UK / West Yorkshire] |
| Business idea competition | • Contest of ideas for the creation of technological or scientific-based industries [Spain / Madrid] |
| Commercialization subsidies | • Commercial Ready program [Australia]<br>• Small Enterprise Research Assistance Program (SERAP) [Hong Kong] |
| Consulting subsidies | • Emprecan (Programa Emprendedores de Cantabria) [Spain / Cantabria]<br>• Support of access to advanced level consultancy services - ECOP 2.2.2 [Hungary] |
| Entrepreneur training | • Mastering Growth Programme [Netherlands]<br>• Red de Pymes Innovadoras (Innovative SME Network) [Spain] |
| Entrepreneur clubs | • Embryo Project - Programme for University Entrepreneurs [Spain / University Miguel Hernandez] |
| Incubation and science parks | • Hong Kong Science and Technology Parks (HKSTP) [Hong Kong]<br>• I3P (Incubator of the Turin Politecnico) [Italy / Piedmont]<br>• Incubatore Tecnologico Genova [Italy / Liguria] |
| Internationalization financing | • Corvinus International Investment [Hungary]<br>• Export Market Development Grant [Australia]<br>• PROGEX National program of technology support for export [Brazil] |
| Loan subsidies | • For the prosperous Hungary enterprise development credit program [Hungary] |
| One-stop information shop | • BIC (Business Innovation Centres) [Italy]<br>• Information Industries Bureau [Australia] |
| R&D tax cuts | • R&D Tax Concessions [Australia] |
| Research commercialization centers | • Co-operative Research Centres [Australia]<br>• Hong Kong Applied Science and Technology Research Institute (ASTRI) [Hong Kong] |
| Research commercialization grants | • PAPPE - Program for Supporting Research in Enterprises [Brazil]<br>• Research into Business (TULI) [Finland] |
| Technological development subsidies (equipment) | • Development of the technical and technological background of SMEs - ECOP 2.1.1 [Hungary] |
| Technological development subsidies (IP) | • VIVACE program of the Hungary Patent Office [Hungary] |
| Venture capital (equity) subsidies | • AISP - Strategy for the financing and service system of innovative start-up companies [Finland]<br>• Innovation Investment Fund (IIF) [Australia]<br>• Southern Italy High-tech Fund [Italy / Southern Italy] |
| Venture capital (tax) subsidies | • Pooled Development Funds (PDF) [Australia] |
| Venture capital fund | • Applied Research Fund (ARF) [Hong Kong]<br>• Information Technology Venture Capital Fund Manager [Hungary]<br>• KVFP Venture capital investment [Hungary]<br>• Piemontech VC fund [Italy / Piedmont]<br>• Pre-seed fund [Australia]<br>• Prestecs Participatius del CIDEM - Participative loans [Spain / Catalonia]<br>• SME development capital program [Hungary] |

Furthermore, I have separated and grouped these categories into yet broader themes. The first thematic separation of measures that I make is between measures that target the process before a firm has been created (pre start-up), and measures that target firms post start-up.

The second broad separation of measures I make is between measures that focus on innovation and technology, and thus measures that traditionally have been the focus of innovation policy – I will refer to this as the "innovation perspective"; and those that focus on the business side and traditionally have been the focus of SME or industrial policy – I will refer to these as the "business perspective". Further, I define an additional type of measures that focuses solely on the provision of financing, and cannot as such be considered to part of either the innovation or business perspectives, and thus form a third "financing perspective". While some measures within both the innovation and business perspective also provide money for various activities, measures within the financing perspective typically provide non-earmarked capital that e.g. can be used as equity. A final type of measures consists of those that focus on internationalization, be it from the innovation/technological perspective, the business perspective, or the finance perspective. It may be difficult to draw the line between e.g. venture capital financing and internationalization financing, since these often go hand in hand (especially for born globals); likewise, it is difficult to draw a line between technological development and business development that is carried out for the domestic market and that which is carried out for the international market. Thus, internationalization support can be considered merely as an extension of the "normal" innovation, business, and financial support; and a type of support that therefore does not necessarily need to be delivered through separate programs.

When thus grouping the categories, six measure "themes" emerge, as illustrated in Figure 12. These themes will be discussed below.

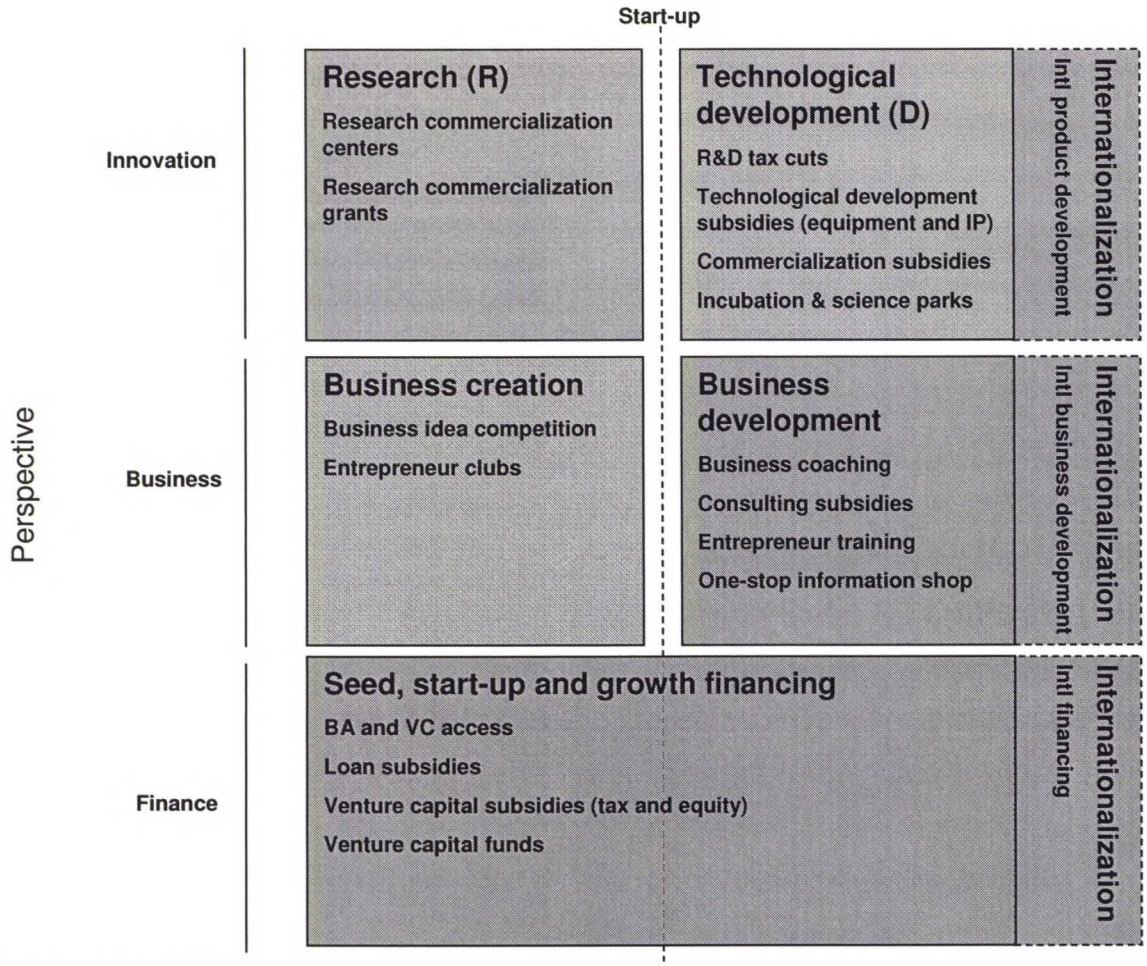


**Figure 12. Emergent themes of categories of support measures**

The support measures in each of these broader themes will be further analyzed and discussed separately in the next sections. The first of these themes, which focuses on supporting innovation and commercialization prior to firm births I will call "Research"; the second theme, "Technological development" focuses on supporting innovation within firms, e.g. in terms of product development. The third theme, "Business creation", focuses on business plan creation and support for potential and nascent entrepreneurs prior to start-up. The fourth theme, "Business development", focuses on developing the business capabilities of firms, including growth-related capabilities. The fifth theme, "Seed, start-up, and growth financing" is focused on facilitating firms' access to capital for the various growth stages. The financing for each of these stages may overlap, and it is thus not necessary or even relevant to separate measures in the financing perspective into pre- and post- start-up measures. Also other types of measures can contribute to the seed stage of financing in particular, e.g. business idea competitions provide prize money that can be used for early financing, and research commercialization grants can also be used towards similar expenses as non-earmarked

seed financing. Finally, although there are different types of support measures for internationalization, I have chosen to group all internationalization support into one discrete theme as these measures are typically organized by a single organization, e.g. an export promotion agency.

The purpose of the themes is to provide a relatively simple map of the various policy support measures that can be undertaken to address high-growth entrepreneurial activity. That is, while policy measures do not need to cover every category as listed in Table 8 (there are many ways to go about addressing the same problem), policy makers should make sure that there is a sufficient amount of support in each of these themes, i.e. that there exists support both pre- and post-startup support for the development of both innovation and business capabilities as well as appropriate support financing and internationalization. The themes also illustrate how policy measures that address high-growth entrepreneurship can appropriately be (re-)organized within the traditional boundaries of Innovation policy and SME policy. For example, all measures in the research sphere (including the creation of commercialization-oriented applied research institutes) should quite naturally fall into the realm of innovation policy. Similarly, business development activities, such as business coaching and entrepreneurship training, should naturally fall into SME policy. Nevertheless, it is clear that policy areas would still need to cooperate across traditional policy boundaries and be coordinated at a high level. For example, the encouragement of new entrepreneurs in should entail close collaboration with education policies. Furthermore, measures in the financing perspective aimed at e.g. catalyzing a functioning venture capital market needs to be broad-based and e.g. entail also fiscal policies.

### 5.3.1 Theme 1: Research (R)

Within the Research theme, there are a total of 4 measures from 4 countries. These types of measures broadly seek to improve the innovative capability of the economy, encourage the commercialization of new research-based innovations and spur the creation of new technological- or science-based firms. In this study, there were two types of these measures, research commercialization centers and research commercialization grants. Research commercialization centers act on the sector-level of analysis, typically targeting specific industries or technologies with increased funding for joint research projects between industry and public research organizations; a good example is Co-operative Research Centers in Australia. Research commercialization

grants act on the entrepreneurial level of analysis, targeting individual researchers with grants for the commercialization of new technologies; an example is Research into Business in Finland.

These measures are publicly funded and generally quite expensive, ranging from approximately 3 MEUR (Research into Business, Finland) to 500 MEUR (Co-operative research centers) annually. Research centers for cooperation between industry and public research organizations tend to benefit mostly the mature firms that typically participate in these centers, but these centers also often aim to encourage the creation of industrial or research-based spin-offs. Research commercialization centers seem to typically focus on a few select sectors that have the highest potential to spur growth within the country.

However, it has provided somewhat challenging to encourage spin-offs through either research commercialization centers or research commercialization grants. For example, for the Research into Business program in Finland, approximately 10% of the supported projects have resulted in new firms. Although the Co-operative Research Centers in Australia have had some success in generating spin-offs, ASTRI in Hong Kong has even reversed its focus from promoting spin-offs to instead focusing on generating new technologies for licensing. In all, it seems safe to say that although measures within the Research theme can have some effect on the creation of new high-growth firms, the effect is likely to be smaller than that which can be achieved from measures within the Business Creation theme which focus more on the motivational rather than the technological dimension of new firm creation.

### 5.3.2 Theme 2: Technological development (D)

Within the Technological Development theme, there are a total of 8 measures from 4 countries. These types of measures seek to support the technological and innovative capabilities of existing firms and thus help generate e.g. higher levels of value-added as well as new innovative products and services.

There are four different types of measures within this theme: commercialization subsidies, incubation and technology parks, R&D tax cuts, and technological development subsidies. Commercialization subsidies provide dollar-for-dollar grants for commercialization activities, such as proof-of-concept and prototyping; a good example is the Commercial Ready Program in Australia. Incubation and technology parks

provide infrastructure to new and sometimes also established technology-based firms; a successful example is the I3P incubator in Italy. R&D tax cuts let firms deduct over 100% of R&D expenses from their income, thereby lowering the effective cost of R&D for profitable firms; an example is R&D Concessions in Australia. Technological development subsidies provide subsidies and support for investments in e.g. technological equipment and IP protection; an example is the VIVACE program in Hungary.

Commercialization subsidies and R&D cuts both tend to be very expensive. For example, the annual budget of the Commercial Ready program and the R&D concessions in Australia are 120 MEUR and 240 MEUR respectively. Furthermore, both these types of measures tend to benefit mainly mature firms and not high-growth SMEs. That is, while Commercialization subsidies can have a clear effect on the growth motivation and success of a small established firm that may want to introduce a new product range, the requirement of dollar-for-dollar matching makes these measures less applicable to high-growth start-ups that may not necessarily have corresponding funds. For high-growth firms, equity financing could be a better form of financing than subsidies or loans for commercialization activities. Similarly, R&D tax cuts will mainly benefit large, mature firms, since young firms typically have no taxable income, while established small firms do considerably less research than do large firms. Furthermore, the effect to which R&D tax cuts actually increase innovation is difficult to evaluate.

Incubation and technology parks tend to be relatively cheaper instruments or even self-sustaining through rents. While incubation and technology parks can be categorized in either the Technological Development theme or in the Business Development theme below, they are included here as they are traditionally within the domain of innovation policy. These programs provide infrastructure to technology-based firms, and may either cater exclusively to start-ups or also provide space for established firms. The upside of science parks for firms of all sizes, which are typically structured around specific technologies, is that they may encourage the formation of clusters around innovation that benefit all firms; the downside is that the specific growth needs of young firms may receive less attention in this environment. Success factors for incubators include a high degree of selectivity of tenants, close proximity to a university and other firms in the same sector, and a strong reputation in the business community which makes the incubator attractive to the highest-potential firms.

Both measures in our sample that provide technological development subsidies are from Hungary, which suggests that these measures may be most appropriate in countries that are catching up with the most developed economies.

A common characteristic within this theme is an exclusive focus on technology- and knowledge based innovation, even though there are also other types of innovation that high-growth firms can leverage. One reason behind this technology-focus may be a perceived "technology deficiency", where countries consider themselves to be underdeveloped in terms of technological innovation. However, this can become a program when most policy initiatives emphasize technology sectors almost to the exclusion of innovation in other sectors, such as in business services. This emphasis does not seem consistent with the fact that rapid growth is not confined to technology sectors – by contrast, an emphasis on technology may cause programs to neglect potential growth ventures in other sectors. One may wonder if, for example, Hong Kong might not benefit from a more explicit and sustained focus on developing business service activities so as to leverage its gateway role in relation to the Chinese market. While a number of initiatives did include knowledge-intensive services in their focus, not a single initiative specialized in these. Perhaps for this reason, not a single initiative had a specific focus on franchising, a sector that provides important growth opportunities for service businesses.

Nevertheless, a joint problem for several measures within this theme is that it seems challenging to explicitly target high-growth start-ups, since subsidies for development activities are likely to benefit mainly established firms that already have a good cash-flow. Activities related to infrastructure such as incubation activities and science parks are therefore likely to be the most effective type of measures for high-growth SMEs within this theme.

### 5.3.3 Theme 3: Business creation

Within the Business Creation theme, there are a total of 2 measures, both from Spain. These types of measures seek to support the creation of new high-growth firms by enhancing the entrepreneurial intent among potential entrepreneurs. The two measures within this theme are the Contest of Ideas for the Creation of Technological or Scientific-based Industries in Madrid and the Embryo Project at University Miguel Hernandez.

There are many apparent benefits of these programs. First, they have relatively modest budgets, although in this sample, this may be partly due to the regional focus of the measures. Second, they effectively target the seed level of new ventures for which there is relatively fewer effective measures compared to the later start-up and growth stages. Third, they primarily target the motivational component of growth, i.e. that of the entrepreneurial intent, which we have recognized as the most important component for the birth and growth of high-growth firms. While there is a clear technology-focus for both of the measures in this study, this type of measures could be expanded to also cater to potential entrepreneurs in non-technological sectors.

Both measures are closely tied with universities. As we have seen, high-growth entrepreneurs are more likely to be highly educated, but while university graduates in particular commonly are typically less interested in an entrepreneurial career, these measures demonstrate that growth-oriented entrepreneurs can be cultivated at universities. Arguably, these types of measures that target the entrepreneurial intent and motivation are even more effective in spawning research-based ventures than measures that provide researchers with grants for commercialization.

It is somewhat surprising that there were not more measures of this type in the sample, but this scarcity may also be symptom of a selection bias from the snowballing method towards measures on the firm-level of analysis. There are indeed similar measures also in other countries; e.g. in Finland, the Venture Cup program is similar to the Contest of Ideas in Madrid, and an increasing number of universities are introducing courses in venturing and entrepreneurship, although these indeed often are implemented on a smaller scale than at University Miguel Hernandez.

### 5.3.4 Theme 4: Business development

Within this theme, there are a total of 14 measures from 7 countries (all countries except for Brazil and Hong Kong). These types of measures seek to support the business-related capabilities of existing firms and thus increase the growth motivation and improve the growth success of these firms.

There are four different types of measures within this theme: business coaching, consulting subsidies, entrepreneur training, and one-stop information shops. Business coaching programs provide firms with a mentor, who offers advice and often performs a diagnostic growth analysis of the firm, and broker and/or subsidize professional

business services based on this analysis. Typical subsidized/brokered services include market research and business planning services. An example of this type of measures is High-growth Start-up in the UK. Consulting subsidies are similar to business coaching programs in that they also subsidize private-sector business services, but these measures do not provide a dedicated mentor and the firms can typically decide more independently what services to buy; an example is the Support of Access to Advanced Level Consultancy Services in Hungary. Entrepreneur training programs offer courses to entrepreneurs and managers, and also encourage networking among entrepreneurs; a successful example is Master Growth Programme in the Netherlands. One-stop shops offer information and broker services but do not offer dedicated mentors to firms; an example is Information Industries Bureau in Australia.

Business coaching measures are generally among the most successful measures in the sample. Of the measures in this category, 4 were very successful, 2 successful, and 2 not rated. A common approach among business coaching programs is to apply criteria for the selection of participating firms. For example, firms may be expected to target a certain turnover within 2-3 years. Coaching programs can be proactive in identifying and choosing firms, as e.g. the Growth Firm Service program in Finland does. Some of these programs focus on the early start-up and growth stages while others focus more on the expansion and maturity stages; nevertheless, all 4 of the "very successful" measures in the sample were focused on the seed, start-up and early growth stages, which indicates that this may be the better approach.

A universal challenge for business coaching programs is a shortage of mentors who are experienced in managing high growth or that there is a large variation in the skill level of mentors. Measures that depend on recruiting their own consultants for coaching (e.g. Firm growth service in Finland and West Yorkshire Ventures in the UK) have been faced with considerable challenges. When measures rely on contracting consultants from private firms, it appears important to uphold quality controls in order to ensure that firms benefit optimally from the coaching (e.g. the South Yorkshire High-growth Start-up in the UK does this, and the Mustard.uk.com in the UK regularly audits the service providers). Meanwhile, private firms can assist in sponsoring these programs by offering their services at discounted rates.

More generally, business coaching programs seem like a better approach to high-growth firms than consulting subsidies. The important value-add of business coaching is that

mentors can engage and motivate the firms to grow, and ensure that any subsidies and grants are used effectively.

Classes and training for entrepreneurs seems like an interesting concept, although the two measures of this type in the sample had quite different degrees of success. It is important that the quality of the training is high so that the high-growth entrepreneurs will consider it worthwhile to participate in and pay for the training sessions (the Mastering Growth Programme in the Netherlands seems to have achieved this). One successful aspect of the Mastering Growth Programme is its emphasis on experience sharing between entrepreneurs during the training sessions. Conversely, a feature that may explain the lesser degree of success for the Red de Pymes Innovadoras program in Spain is that the training and networking to a large degree takes place on the web. Nevertheless, both entrepreneur training measures in the sample were very new (2005, 2006) and thus may require time to develop further.

By contrast, the one-stop information shop measures in the sample were quite old (1984, 1992), and in general these seemed to play a relatively small role for high-growth firms, and they were also generally regarded as less successful.

### 5.3.5 Theme 5: Seed, start-up and growth financing

Within this theme, there are a total of 16 measures from all 9 countries, making these types of support measures for high-growth the most common in the sample. These measures seek to support the start-up and growth of firms by either supplying or facilitating access to financing, most commonly venture capital.

There are four different types of measures within this theme: BA and VC access, loan subsidies, venture capital subsidies, and venture capital funds. BA and VC access programs facilitate the access to business angel and venture capital funding by assisting firms to become investment-ready, training entrepreneurs and potential business angels in early-stage financing, and/or encouraging networking between entrepreneurs and investors; a successful example is the TechnoPartner Programme in the Netherlands. Loan subsidies improve the risk/return ratio for lending to SMEs by providing banks with loan guarantees or subsidized capital for re-lending. Venture capital subsidies consists of measures that either co-invest with private VC funds, often with an asymmetrical payoff ratio (what I refer to as "venture capital equity subsidies"), or provide tax benefits for private sector investments in SMEs (what I refer to as "venture

capital tax subsidies"); successful examples of each type include Innovation Investment Funds and Pooled Development Funds in Australia. Venture capital funds are publicly owned funds; a successful example is Prestecs Participatius del CIDEM in Spain which offers seed capital of up to 300.000 EUR. A distinction can be made between measures that facilitate access to or encourage private-market funding of firms (the three first types), and measures where governments themselves finance firms through equity investments and capital loans (the fourth type).

When considering various options for growth financing, it is important to recognize that it is not enough that firms get only some amount of financing. Rather, firms with a high potential need *enough* financing in order to enable growth. Experience from the Finnish INTRO project has shown that 500.000 EUR to 1 MEUR is a typical amount of funding needed for the start-up and early-stage growth stages for knowledge-based businesses. On the supply side, raising enough financing may call for syndication of business angels and venture capital funds, while on the demand side, this level of investment requires a very high quality of business plans as well as a high level of demonstrated commitment from entrepreneurs.

BA and VC access programs are quite cost-efficient programs for encouraging private-market venture capital and also seem to have a high success rate (3 of 4 programs in the sample were considered very successful). All of these programs are focused on high-growth SMEs in the technology- or knowledge-based sector. While most of the financing measures focus on improving the supply of capital, BA and VC access programs also seek to strengthen the demand-side of financing by improving the investment-readiness of firms. A good example of improving investor-readiness is g2i in the UK in which entrepreneurs initially can evaluate themselves through a software package. These programs also facilitate contacts between entrepreneurs and investors, as entrepreneurs and business angels need to meet in person in order for true networks and trust to form. These contacts can be facilitated through exhibits or joint training sessions; a good example of such a program is INTRO in Finland. Entrepreneurs also often need training in venture capital financing in order to understand what various financing options are available and how to valuate their firm. Similarly, also the investors may need training. Many potential business angels who may not have been involved previously in financing knowledge-based high-growth companies have limited knowledge about early-stage financing, e.g. in terms of contracting.

There are two main approaches to increasing the supply of early-stage venture capital: through venture capital funds that governments themselves capitalize and/or manage (7 measures from 5 countries) or through subsidies for private-sector venture capital sector (4 measures from 3 countries). While the latter approach has the benefit of being more market-based and in the longer run can help to form a self-sustaining VC market for early-stage financing, each of these two approaches seem appropriate for different purposes. Publicly funded venture capital funds can generally be argued to be more appropriate for the earliest stages of funding (seed stage), which involve the highest degree of uncertainty, while subsidies for private funds may be more appropriate for later stages of funding, e.g. during the early growth and expansion stages. By focusing public venture capital funding on the seed stage, there is also less risk that public VC funds would crowd out private-sector financing.

Programs that co-invest public and private venture capital also thereby tie in the private investors' expertise (KTM 2004a). However, if public programs subsidize and support only a number of selected private VC funds, these funds may gain a competitive advantage over to their peers which could skew competition in the VC industry (LTT-Tutkimus 2005). Also fully publicly funded venture capital funds should benefit from cooperating with business angels and venture capitalists to choose investments, as public officials may not be the most qualified professionals to pick the firms with the highest growth potential (the Pre-seed fund in Australia employs this model). By contrast, the publicly funded Applied Research Fund in Hong Kong which picks firms itself has suffered considerable losses and recognized that its investments have often been inferior to those of private-sector funds.

While an important support tool for SMEs in general, loan subsidies can generally be considered inappropriate for high-growth SMEs due to the higher risk and higher potential returns of these ventures. The only measures in the sample that offers loan subsidies are the For the Prosperous Hungary Enterprise Development Credit Program in Hungary, which offers subsidized loans to banks for re-lending, and the TechnoPartner Programme in the Netherlands, which offers an 80% loss guarantee for up to 100.000 EUR loans to SMEs that have been certified by the program. However, the program in Hungary rather focuses on the "local SME sector", and is thus probably not primarily meant for high-growth SMEs as we have defined them, while the

guaranteed loan in the Netherlands is quite small and may be considered as merely a supplement to other forms of financing.

### 5.3.6 Theme 6: Internationalization

There are a total of 3 measures from 3 countries in the internationalization theme. Each of these measures is quite different but the broad goal of all measures is to strengthen the international-market capabilities of firms.

The Export Market Development in Australia provides grants for international business development, the PROGEX program in Brazil provides grants for product development and customization for international markets, and Corvinus International Investment in Hungary mainly provides financing for the establishment or purchase of subsidiaries abroad.

Although a focus on growth firms is implicit, all of the measures tend to focus on the expansion and maturity stages of growth and thus do not primarily address the needs of born globals. That is, the measures are principally targeted at companies that already have achieved a strong domestic base, and these measures are as such not wholly suitable for start-ups and young firms. Nevertheless, it is reasonable that born globals would use funding obtained from e.g. venture capital funds to finance also their internationalization activities, and therefore, no ear-marked internationalization financing may be needed for these firms.

## 5.4 Application to frameworks

As noted in the literature review, policy measures can act on four different levels of analysis: the entrepreneur-, firm-, sector-, or environmental level of analysis. Similarly, policy measures can act on various stages in the firm growth pipeline by either 1) creating more entrepreneurial firms, 2) increasing growth motivation, 3) improving growth success, or 4) improving internationalization success.

For this analysis, each measure has been fitted to one level of analysis, and each team has judged whether a measure successfully addresses any of the stages in the growth pipeline. For the measure's effect at each stage in the growth pipeline, teams were given the choices of yes (a clear positive effect), possibly (an effect is possible but uncertain), or no (no effect or not relevant to the measure); each measure can address several stages in the growth pipeline. Figure 13 plots these measures to the corresponding levels of

analysis and steps in the growth pipeline. Short names have been used to reference the measures; the corresponding names can be found in Appendix 2.

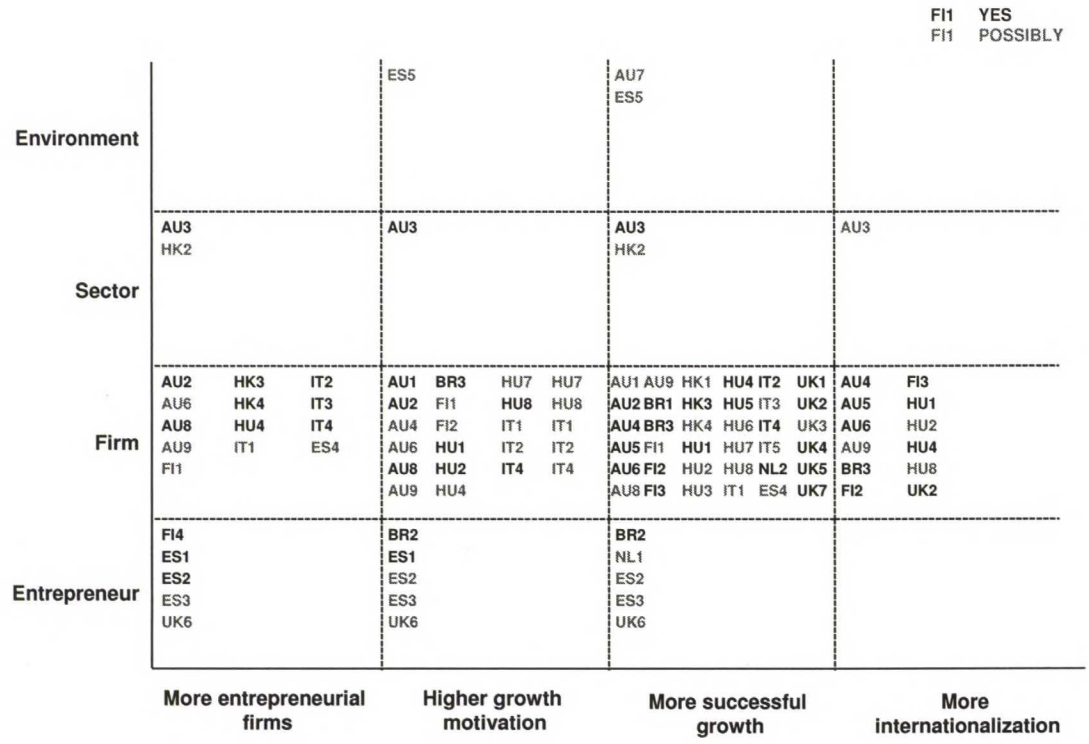


**Figure 13. Frequency of measures at different levels of analysis and steps in the "growth pipeline"**

In terms of levels of analysis, we can see that the majority of measures act on the firm-level of analysis (36 in total). This is not surprising, since this level of analysis may offer the most direct way to support firm growth. These measures seem most successful in enabling more successful growth for these firms; but several measures also address the three other steps in the growth pipeline.

7 measures act on the entrepreneurial level of analysis, and these measures seem to display a reasonable success in encouraging the birth of new entrepreneurial firms and increasing growth motivation. However, measures at the entrepreneurial level of analysis do not generally address the successfulness of growth or internationalization of the firm; issues that indeed can be considered mainly concern firm-level of analysis.

2 measures act on each of the sector and environmental levels of analysis respectively. On the sector level, the Australian Co-operative Research Centres (referred to in the graph as AU3) seems to be successful in creating both new firms, motivating the growth of firms, and enabling the success of these firms while ASTRI in Hong Kong has a less clear effect. On the environmental level of analysis, the effects of the measures on firms

are likewise less clear, which is not wholly surprising due to the high level of analysis and thus a larger degree of detachment from the actual growth processes of firms.

In terms of reported success, measures on the entrepreneurial level of analysis have generally had the highest success rate. Out of the 7 measures on the entrepreneurial level of analysis, 6 were among those 25 measures that were considered most successful and chosen for detailed case analysis. Firm-level measures show a more split success; 17 were among the top-rated measures and 14 were not. Both of the two sector-level measures were among the top-rated, while neither of the two environmental-level measures were among the top measures. This is illustrated in Table 9 below.

**Table 9. Success distribution for measures on different levels of analysis**

| Level of analysis | Among top-rated measures (25 in total) | Not among top-rated measures (17 in total) | Not rated (5 in total) |
|---|---|---|---|
| **Entrepreneur** | 6 | 1 | |
| **Firm** | 17 | 14 | 5 |
| **Sector** | 2 | | |
| **Environment** | | 2 | |

Based on the frequency analysis, what is missing completely from our sample are measures on the environmental level that address the issue of creating new firms and enabling internationalization. Examples of the former type could include programs for improving the entrepreneurial culture or the general attractiveness of self-employment (e.g. through fiscal measures). Additional measures that may be called for would include co-operative sector-level measures for internationalization, for example through by encouraging networks between young high-growth firms and large international firms on which the smaller firms can piggy-back. Nevertheless, although several measures were reported on the entrepreneurial level of analysis, even more measures could certainly be called for at this level given the importance of the entrepreneur's intent and motivation for the birth and growth of firms.

# 6 Conclusions and recommendations

## 6.1 Towards a high-growth policy

A greater degree of entrepreneurship is often considered an important source of new jobs and innovation as governments seek to encourage growth and development. However, as we have seen, encouraging more people to become entrepreneurs is only half correct. Even though, for example, campaigns that encourage unemployed persons to start new firms may service valuable social policy goals, they will not necessarily be effective in fostering job creation.

The majority of jobs are created by a small minority of firms that grow the fastest. These 'high-growth firms' are in turn typically founded by the most ambitious entrepreneurs, and therefore, it will be important to get the right people to start new firms and for government to provide comprehensive support to these particular firms in order to effectively promote growth and development. The needs of high-growth firms are demanding. Therefore, effective policy will likely need to focus available resources on a lesser number of select firms rather than spread resources to a larger number of firms.

High-growth firms, as the SME sector in general, are highly heterogeneous, and it is unlikely that one type of policy fits all companies. Single support measures will not alone be able to spur new high-growth firms, but rather a comprehensive portfolio of measures will be needed in order to support firms through all stages of the firm life-cycle and for all critical growth factors (e.g. motivation, resources, and opportunity). As we have seen, a policy for high growth firms needs to address issues at several levels of analysis, namely the entrepreneurial, firm-, sector-, and environmental levels of analysis. Also in this line of thinking, Acs (2001) observes that 'entrepreneurship policy' will cover four 'facets' or 'layers' of society, from the individual entrepreneur to the national economic and societal context (Figure 14). Policies addressing only one layer may not lead to successive outcomes if other layers are neglected. For example, measures that seek to provide funding for high-growth firms are likely to be ineffective unless the right individuals have not already been persuaded to start these firms. Likewise, measures that seek to reduce compliance costs will have little effect on growth if the motivation and

opportunities for growth are absent. Furthermore, background factors should affect the chosen measures. All countries are not the same, and therefore different types of measures may be needed in different countries in order to suit the cultural, entrepreneurial, economical, and legal environment. Therefore, a balanced portfolio of policy measures, tailored to suit the national economic and social context, is needed to optimally support high-growth entrepreneurship.

| | Goals | Targets | Instruments |
|---|---|---|---|
| **Agent – Occupational Choice Policies** | More Effective Entrepreneurs | Individuals | **-create awareness<br>-entrepreneurship training<br>-facilitate networks** |
| **Business – Enabling Policies** | Continuous Innovation | New Firm Formation | **- finance<br>-regulatory relief<br>-SBIR<br>-science parks<br>-tech commercialization** |
| **Economy – Supporting Policies** | Economic Growth | Institutions- Universities Government Corporations | **-R&D<br>- higher education<br>- venture capital** |
| **Society – Social Policies** | Equal Opportunity | Wealthy Individuals | **-philanthropy<br>-taxes<br>-social pressure<br>-legal structure** |

**Figure 14. The Four Facets of Entrepreneurship Policy (Acs 2001)**

As policy makers are recognizing the importance of high-growth entrepreneurship for economic growth and development, the time for "generic entrepreneurship policy" is passing. If economies are to take full advantage of their entrepreneurial potential, focus and quality must be emphasized when designing and implementing support measures for entrepreneurial activity in general and for high-growth SMEs in particular.

## 6.2 Answers to research question

The goal of this paper was to identify and analyze effective measures that policy can employ to support high-growth SMEs. The research question for this report was broad, *what are good practice government policy measures for supporting high-growth SMEs?*, and thus designed to permit an exploratory inquiry into the field of high-growth policy measures. To focus the work, three intended contributions were formulated for the thesis. These intended contributions are listed below in Table 10 with a brief evaluation of whether the thesis has successfully reached these intended objectives.

**Table 10. Evaluation of the contribution of thesis**

| Original intended contribution | Result |
|---|---|
| • Identify, describe and analyze support measures that have been implemented to support high-growth SMEs | • To this end, 47 support measures from 9 countries have been identified, of which the 25 most successful measures were described and analyzed in detail |
| • Develop a framework for categorizing support measures for high-growth SMEs | • A comprehensive categorization of similar measures has been made; and these categories were in turn assigned into distinct broader themes (6 themes in total) that can be used for evaluating the completeness of public support for high-growth SMEs |
| • Identify good practices and provide normative recommendations for policy makers about how to develop effective policy measures for high-growth SMEs | • Examples of good practices that characterize the most successful cases have been identified. Furthermore, comparisons between measures within the same theme were also made and some success factors were identified. A less formal discussion around normative recommendations is included in the next section |

One limitation of the results is naturally that the evidence is based on a number of limited cases, and that the analysis and evaluation of the cases in turn is based on the often inevitably subjective opinions of local researchers and policy makers. Nevertheless, the purpose of the study has not been to create irrefutable fact in terms of effective measures to be implemented directly, but rather to explore and identify useful examples and characteristics of good practice support measures. As such, I consider the study to be successful.

In addition to outlining characteristics of successful measures, the thematic division of measures into pre- and post start-up and the three perspectives (innovation, business, finance) as illustrated in Figure 12 can be used as a checklist for policy makers to ensure that a sufficient number of appropriate measures have been introduced within every theme. The thesis also provides a summary of the relevant literature on firm birth, growth, and internationalization from a principally behavioral perspective, as well as gives an overview of current practices in SME policy and Innovation policy.

## 6.3 Recommendations

Finally, the recommendations listed below are a result of what I have learned during the research process, in analyzing data and reports as well as in interviews with policy makers and other researchers. These recommendations may thus be considered a catalog of personal insights as well as of those insights proposed by participating policy makers and researchers, rather than empirical fact; but they should nevertheless be valuable as a comprehensive source of ideas on policy for high-growth firms.

### 6.3.1 Integrate horizontally

Support programs are often introduced over time by various agencies and organizations and thus the structure of the support measures is therefore not necessarily developed in a coordinated way. As a result, the portfolio of support measures may often be perceived by firms as complicated and confusing, while firms also generally have a low awareness of public support services (CEC 2001). For example, in Finland, only about one fourth of new start ups use these services (Rouvinen and Ylä-Anttila 2004).

Furthermore, the multi-faceted nature of the entrepreneurial birth and growth processes means that a single policy department, or a single policy measure, is unlikely to alone achieve optimal results. There is thus a need to make support programs for entrepreneurs and firms both more streamlined and more coherent, and in order to achieve this, a broad-based cooperation between the existing support organizations and policy departments is called for. For example, as policy measures for high-growth firms cut across both SME policy and innovation policy, these policy areas should employ joint-effort programs to encourage high-growth entrepreneurship. In the longer term, various scattered organizations that support high-growth firms should be further integrated (KTM 2004b). Policies for high-growth firms should further seek to involve the education, labor, and fiscal policy departments in designing and implementing programs. Integrating policy organizations and programs horizontally should lead to more effective programs, increase the awareness of support measures by reducing the complexity of these programs and support organizations, as well as reduce any duplication of efforts that now may exist due to scattered efforts within and between agencies.

In addition, employment of one-stop shops or dedicated firm consultants (business coaches) may be appropriate in order to facilitate access by firms to support programs; the goal of such measures should be to provide one responsible "desk" or public officer for each firm (KTM 2004a). In addition to simplifying access to support measures, this approach may increase the awareness of support measures by reducing the search costs for the entrepreneur.

### 6.3.2 Think holistically

Firm choices and behavior regarding growth, innovation, product development, market segment, financing, and internationalization are all related and these decisions are made

holistically by the firm (Luostarinen 1979). Effective high-growth policy will therefore need to respond with an equally holistic portfolio of programs to support these firms.

The need for a holistic perspective is related with the above recommendation on horizontal integration. This need arises from both the multi-faceted nature of the entrepreneurial processes, as well as from the time lags involved. The growth process for a firm typically takes around 7 years (Hanks et al. 1993), and appropriate support measures should be available during each stage of the growth process. Thus, policy measures should be orchestrated in such a way that they address all stages of the entrepreneurial process from opportunity recognition (e.g. in basic and applied research) to market launch and eventual growth and consolidation. Currently, it appears common that firms may experience "support gaps" as they develop and move between support programs. In order to avoid such gaps, the timing and objectives of different policy measures should be consistent and complementary.

### 6.3.3 Focus on quality

By quality focus I will refer to two separate issues; first, policy measures for high-growth firms should be selective and focus on the entrepreneurs and firms with the highest potential; second, in order to meet the demands of high-growth entrepreneurs, policy measures need to emphasize and improve their own quality of support.

On the individual-level of analysis, measures should focus at encouraging well-educated and reasonably high-income individuals to choose an entrepreneurial career, since these individuals typically are the ones responsible for high-growth ventures (GEM 2005). For example, policy measures designed to encourage entrepreneurial spin-offs from established knowledge-intensive companies and research institutions might prove useful in cultivating high-growth entrepreneurial activity in economically developed countries. However, employed and highly educated people typically face higher opportunity costs for giving up their current careers, and thus a higher level of support may be required to motivate these individuals to pursue an entrepreneurial career. Also educational programs may have a role to play for increasing the awareness of entrepreneurship as an attractive career choice for these individuals.

On the firm-level of analysis, policy measures should be more selective about which firms to support. There is generally a trade-off between "resources focus" where resources are channeled to only the highest-potential SMEs and "resource spread"

towards a larger number of SMEs, but I have argued that public policy for entrepreneurship can achieve the largest effect on employment and welfare when concentrating on firms with a high-growth potential. The need to be selective about picking firms stems from a limited availability of resources for public support for SMEs combined with the demanding needs of high-growth firms. For example, generic mentoring of only a few hours is not likely to add significant value to ambitious entrepreneurs; instead, more in-depth mentoring services may be needed in order to effectively serve the needs of these entrepreneurs. Similarly, in terms of venture capital, 10.000 EUR is will not typically be enough to achieve high growth; rather, around 1 MEUR will likely be needed. For example, in Finland, the per-capita number of firms part-funded through venture capital is one of the highest in the world; one reason for this is that there are a large number of government-run venture capital programs in Finland. However, when looking at the level of investment per firm, Finland ranks among the lowest in the western world. Thus, the government-driven policy objective of capitalizing a larger number of firms with lower amounts of venture capital may arguably have resulted in a situation in which investments per firm is sub-optimal.

There is also a need for policy measures to become more sophisticated. In general, providing value-adding support for high-growth entrepreneurial ventures tends to be more demanding than for low-growth firms. A way to achieve a higher quality level of the support for high-growth firms in particular could be to earmark budgets for support measures targeted exclusively at these firms.

### 6.3.4 Target firms proactively

In order to increase the awareness about public support programs among high-growth firms and achieve a higher degree of selectivity, a proactive approach by which support measures actively identify and address high-growth firms instead of vice versa may be appropriate. Since it may be challenging to identify these high-potential firms, the selection should ideally be executed by groups of individuals who possess a good knowledge of projects and firms at e.g. research facilities or in incubators.

However, a proactive approach is not without risks. For example, policy-makers can easily fail to identify prospective high-potential firms and excluded firms may complain about perceived discrimination. Therefore, any proactive approach should be implemented carefully in order to maintain transparency, responsiveness, and flexibility.

As it is questionable whether public agencies really are the best actors to choose which firms to support (private-sector actors such as business angels or venture capital funds are arguably more qualified to do this), proactive selection cannot be the only method for selecting firms to support.

Other methods to achieve a high degree of selectivity may be to filter applicant firms or let firms self-select based on specific criteria such as firm age, growth ambition, and strategy. Also competition-based measures may be appropriate tools for increasing the awareness of public support measures and raising the quality of participating firms.

### 6.3.5 Involve private-sector actors

As we have seen, in order to add value to high-growth firms, support measures need to offer sophisticated services. However, the public sector alone may not be able to meet all the demands for sophisticated services by high-growth firms (GEM 2005). Therefore, market-based or mixed private/public measures (e.g. service vouchers, mixed private/public VC funds) should be used instead of direct public support whenever possible.

Private-sector participation is particularly important during the later stages of the firm growth process. Quite often, the provision of the right kind of support requires intimate understanding of the business and a wide network of contacts, which is something public sector support organizations more rarely can offer. For example, programs that offer coaching services should ideally involve entrepreneurs who have experience in managing rapid growth. Nevertheless, balancing public- and private-sector service provision is not easy, because overlaps and insufficient coordination may lead to crowding and market distortion.

Another important role for high-growth policy should be to promote networks and links between entrepreneurs/firms and various private-sector actors. Examples of such networks include business angel networks, venture capital networks, and researcher/industry collaboration networks. Policy measures should also promote the development of a private business service infrastructure which can cater to the needs of high-growth ventures.

### 6.3.6 Care about image

In order to continuously attract firms with a high-growth potential (what venture capitalists refer to as "deal flow"), it is important that support measures achieve a strong reputation in the business community and thus enjoy an image of professionalism and competence. Such street credibility is especially important in order to attract the firms with the highest potential and ambition, as these firms may otherwise shun public support as inefficient and not sophisticated enough to deliver tangible value. In the study, this phenomenon was noted e.g. in the West Yorkshire program in the UK.

In order to achieve this credibility, measures need to be flexible and non-bureaucratic in order to ensure that entrepreneurs get appropriate support without undue delay. Private-sector participation, e.g. by involving established firms, venture capitalists, and experienced entrepreneurs in the program, may also be important in order to promote an image of relevance of the program. It is likewise important that programs are well-designed and tested before launch. Unless a support measures succeeds to establish a positive image at the outset, such credibility may be challenging to build up later.

### 6.3.7 Motivate and train entrepreneurs

Entrepreneurial motivation and entrepreneurial intent are strong determinants of the birth and growth of high-growth firms. While motivation to grow often may determine actual growth, satiation about the current firm size is conversely the principal reasons why firms do not grow or stop growing (Davidsson 1991). Thus, it is clear that policy measures that seek to promote high growth need to address the motivation, intentions and attitudes of entrepreneurs.

Policy can employ a range of methods on various levels of analysis to influence the motivation and behavior of entrepreneurs. An aspect that perhaps has enjoyed little previous mention in this study is the cultural dimension of entrepreneurship, where policy through directed programs could seek to improve the perceived social desirability of entrepreneurship and reduce the stigma associated with entrepreneurial failure. For example bankruptcy regulation may play an important role in how society views entrepreneurial failure.

The entrepreneur's motivation can also be indirectly influenced through training programs that address the entrepreneur's perceived level of ability. Training in

evaluating different funding options and understanding the concerns of venture capitalists may be particularly important (CEC 2005d).

### 6.3.8 Target universities

While university students may generally be less prone to become entrepreneurs, universities may still offer an ideal spawning ground for *high-growth* entrepreneurs as founders of high-growth ventures are likely to be well educated (GEM 2005). Educational programs at universities have a role to play in increasing the awareness among university students about the possibilities of an entrepreneurial career and thus raising the students' entrepreneurial intent. For example, the Embryo project at University Miguel Hernandez in Spain illustrates that students and researchers successfully can be encouraged to pursue an entrepreneurial career.

Commercialization of university-based research has traditionally been quite challenging. One problem, which e.g. the TULI program in Finland has experienced, is that there exists a gap in support between research commercialization projects and actual firm start-up. Thus, in order to yield more firms, research commercialization projects that evaluate the viability of a new venture need to be followed up with more comprehensive start-up support from the business and financing perspectives. Also incubation services have an important role to play in facilitating the start-up process of university spin-offs.

Furthermore, when directing resources towards *applied* research in public research centers and universities, an effective model may be to set up cooperative research centers with industry, since industry-driven research has been shown to be more likely to create opportunities for successful innovation and commercialization (Kotilainen 2005).

### 6.3.9 Follow-up and adapt

Finally, in order to remain effective, policy measures need to be monitored and followed-up regularly and be allowed to continuously adapt to a changing environment. New support measures should be allowed to continuously replace old ones. For example, the average age of the 25 most successful measures in this study was 5.2 years compared to 9.4 years for the 17 measures that were rated as less successful. One model by which to achieve this would be that policy makers take a step back from governing actual measures, and instead provide a pool of funds for high-growth policy measures that separate support agencies can allocate to the most relevant and successful programs

(Kotilainen 2005). In any case, in order to attract qualified personnel to work with public support measures, it is important that employees are provided with an opportunity to easily move between measures as the policy focus changes.

In order to enable more effective monitoring and control of support measures for high-growth SMEs, better indicators are needed. As this study also illustrates, it is difficult to measure the effect and efficiency of these support programs. For example, there hardly exist any relevant indicators at all for measures that seek to promote and sustain the creation and growth of innovative firms (Arundel and Hollanders 2005). Policy measures should at the very least seek to operationalize and measure the growth intent and growth success of the client entrepreneurs and firms; although a complicating aspect of monitoring is that growth takes time.

Finally, high-growth firms are ambitious, and likewise, support measures should set ambitious targets for themselves. By employing a horizontal and holistic approach, focusing on quality, addressing entrepreneurs and universities, building a credible image through participation of private-sector actors, and by aiming high, public policy measures for high-growth SMEs can prove to be important tools for economic development and growth.

## 6.4 Limitations and avenues for further research

This research examines specific support measures for high-growth firms in a range of countries, and attempts to identify relevant success factors and good practices. In other words, the unit of analysis has been the measure. However, as noted previously, measures do not exist in a vacuum and an individual measure will not by itself be enough to support all types of needs for high-growth firms. Thus, a comprehensive *portfolio* of support measures is called for to effectively support high-growth firms. In fact, in each country there are probably at least around 50 separate measures or programs that all have some distinct part to play in the support of high-growth firms. As this study focuses on only a few select individual measures in each country, such an analysis of the system or portfolio of measures in economies was not possible. Nevertheless, for further research, a study with the portfolio of measures as the unit of analysis – looking e.g. at potential synergies and overlaps between measures - would have a potential to add significantly to the current body of knowledge.

Furthermore, as we have also noted, the design of support measures will to a significant degree depend on the national context. One obvious research avenue would thus be to analyze how contextual differences affect the appropriateness of various high-growth policy measures. Thus far, when evaluating the contextual dimension for support measures in the various catalogs and reports within SME policy and Innovation policy, the issue has usually at best been dealt with as individual "national suggestions for development".

An alternative research approach that could generate useful results on the effectiveness of high-growth policy measures would be to conduct a case study on successful high-growth firms and analyze the role of public support measures in their development. That is, instead of taking the support measure as the unit of analysis, it should also be possible to obtain interesting results by taking the individual high-growth firm as the unit of analysis. Nevertheless, since many of the measures that specifically target high-growth SMEs as well as the firms they support are still typically quite young, such an evaluation may perhaps ideally be carried out only after a few years.

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**APPENDIX 1**

SUPPORT MEASURE SUMMARY SHEET, PAGE 1

| **Interviewee Background Information** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name of interviewee: | | | | | | | | | | | |
| | Last | | | | | First | | | | | Title |
| Email address: | | | | Employer: | | | | Position: | | | |
| **Identification of Support Measure** | | | | | | | | | | | |
| Year started: | | | | | Country & region: | | | | | | |
| Name of the support measure/initiative/program: | | | | | | Ongoing practice / Long-term project (>2 years) / Short-term project (<2 years) | | | | | |
| Web address: | | | Telephone: | | | | Email of contact person: | | | | |

| **Support Measure Background Data** | |
|---|---|
| Participating institutions: | |
| Main financiers, their funding shares; Is financing public/private/mixed? | |
| Total budget, time allocation (from year to year): | |
| Number of people directly working with the measure: | |
| **Support Measure Focus and Operation Data** | |
| Firm life cycle stage (Pre start-up/Start-up/Expansion/Maturity): | |
| Industry or technology sector addressed: | |
| Principal type of support (i.e. what does the measure provide, e.g. money [specify type, e.g. equity, loans, grants], advice, mentoring, training, forging of networks, etc) | |
| Open-ended description of support provided: | |
| Firm resource bottleneck addressed (e.g. capital, social capital and networks, reputation/brand, business expertise, technological expertise, firm-level innovation, infrastructure): | |
| Growth mechanism addressed (e.g., more entrepreneurial companies, higher growth motivation, more successful organic growth, higher degree of internationalization): | |
| Other focus and operation data: | |

**APPENDIX 1**

SUPPORT MEASURE SUMMARY SHEET, PAGE 2

| **Support Measure Performance Data** | |
|---|---|
| Number of firms or projects processed in total: | |
| Number of firms or projects per annum: | |
| Growth rates achieved for the firms involved (if available): | |
| Quantitative performance data for the support measure (results, impact): | |
| Qualitative evaluation of the support [not successful, somewhat successful, successful, very successful] | |
| Examples of notable success cases and particularly successful graduates (provide web sites if possible): | |
| VC funding received: | |
| Other comments: | |
| Lessons Learned: Please describe below why this support measure has been successful, what have been the most important lessons learned, how the measure has evolved over time, what are the most important good practice lessons to be shared with other policy measures. Also use this space to provide your own analysis and insights. | |
| | |

| Basic data | | | | | | | | | Operational and focus data | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | Short name | Region | Program name | Web address | Year started | Ongoing / Long term / Short term | Principal institution | Total annual budget (MEUR) | Privately or publicly funded | Principal unit of analysis | High growth or SME focus | Firm life-cycle stage | Principal type of support by government | Firm resource bottleneck addressed | Industry or sector addressed | Description of support |
| Australia | AU1 | | Commercial Ready program | www.ausindustry.gov.au | 2004 | Long-term project | AusIndustry (Department of Industry Tourism and Resources) | 120 | Public | Firm | All SMEs | Early growth, Expansion | Money (Grant) | Firm-level innovation | All | Competitive merit-based grants to SMEs for early-stage commercialization, R&D with high commercial potential, and proof-of-concept activities. Requires matching (dollar for dollar) contributions by receiving company; grants ranging from €30k to €3million, for projects up to three years. Supports both applied research in new ventures and applied research leading to innovations by established companies |
| Australia | AU2 | | Commercialising Emerging Technologies (COMET) | www.ausindustry.gov.au | 1999 | Long-term project | AusIndustry (Department of Industry Tourism and Resources) | 6,5 | Public | Firm | High growth SMEs | Start-up, Early growth | Money (Subsidy) | Business expertise, Firm-level innovation | All | Competitive merit-based mentoring and innovation management advice services through a network of private sector business advisers. Financial assistance is available to subsidize access to service providers in marketing, commercialization, intellectual property and business planning. The subsidy covers 50% or 80% of eligible expenses; from €3k to €72k for up to two year projects. Directed at very early stage ventures; evaluates the potential of the applicant with regard to their perceived entrepreneurial abilities. COMET provides support to early-growth stage companies, spin-off companies and individuals who: 1. are looking to grow substantially through commercialization of an innovative product, process or service; 2. have identified weaknesses that are preventing them from implementing a commercialization strategy; and 3. are unable to fund activities to address these weaknesses |
| Australia | AU3 | | Co-operative Research Centres | https://www.crc.gov.au | 1990 | Ongoing | Department of Education, Science and Training | 500 | Mix public | Sector | All firms | Seed, Maturity | Money (Subsidy) | Firm-level innovation | Other sectors | Establishes research centers in a joint effort between researchers and industry around multiple specific technologies (2002: 69 CRCs in 6 sectors: environment, agriculture, ICT, mining, medical science, technology and manufacturing). |
| Australia | AU4 | | Export Market Development Grant | www.austrade.gov.au | 1980 | Ongoing | Austrade | 73 | Public | Firm | All high growth firms | Expansion | Money (Grant), Mentoring | International market access | All | Grants to support export development. "The Export Market Development Grants (EMDG) scheme is the Australian Government's principal financial assistance program for aspiring and current exporters. Administered by Austrade, the purpose of the scheme is to encourage small and medium sized Australian businesses to develop export markets. EMDG reimburses up to 50 per cent of eligible export promotion expenses above a threshold of $15,000. To access the scheme for the first time, businesses need to have spent $15,000 over two years on eligible export marketing expenses. The scheme supports a wide range of industry sectors and products, including inbound tourism and the export of intellectual property and know-how outside Australia." |
| Australia | AU5 | Queensland | Information Industries Bureau | www.iib.qld.gov.au/programs.asp | 1992 | Ongoing | Queensland Dept. State Development Trade and Innovation | n/a | Public | Firm | High growth SMEs | Start-up, Early growth, Expansion, Maturity | Advice | Business expertise, Capital (VC) | ICT, Biotech | Assists Queensland technology SMEs with export, venture capital and business growth issues through one-on-one business advice and education programs |
| Australia | AU6 | | Innovation Investment Fund (IIF) | www.ausindustry.gov.au | 1998 | Long-term project | AusIndustry (Department of Industry Tourism and Resources) | 9 | Mix equal | Firm | High growth SMEs | Start-up, Early growth, Expansion | Money (Equity) | Capital (VC) | Technology | VC program consisting of nine licensed private sector venture capital funds which provide VC to small, high tech businesses at seed, start-up or early expansion stages of development; aim is to encourage development of new-technology businesses and develop a self-sustaining early-stage VC market and experienced fund managers. Private sector adds about half of the capital |
| Australia | AU7 | | Pooled Development Funds (PDF) | www.ausindustry.gov.au | 1992 | Ongoing | AusIndustry (Department of Industry Tourism and Resources) | 3,6 | Public | Environment | All SMEs | Early growth, Expansion | Money (Tax concession) | Capital (VC) | All | Tax benefits for private sector investment companies which raise capital from investors and invest in SMEs. Pooled Development Funds and their shareholders receive tax benefits on the income derived from their equity investments. This is intended to compensate for the higher risk of investing in SMEs. Pooled Development Funds are taxed at 15% on the income and gains derived from equity investments in Australian SMEs. Pooled Development Fund shareholders are exempt from tax on the income and gains derived from holding and disposing of Pooled Development Fund shares. Eligible Pooled Development Fund investments are made by acquiring newly-issued shares in SMEs with total assets of less than $50 million.The investee company must have issued the shares for the purpose of raising capital to: establish a new business activity, substantially expand production capacity or services, expand or develop markets. |
| Australia | AU8 | | Pre-seed fund | www.ausindustry.gov.au | 2002 | Ongoing | AusIndustry (Department of Industry Tourism and Resources) | 7,8 | Mix public | Firm | High growth SMEs | Seed, Start-up | Money (Equity) | Capital (VC) | All | Four early-stage venture capital funds investing in projects or companies spinning out from universities or government agencies. Investment is limited to €600k per project or company. Funds are managed by experienced venture capitalists providing management and technical advice |
| Australia | AU9 | | R&D Tax Concessions | www.ausindustry.gov.au | 1985 | Ongoing | AusIndustry (Department of Industry Tourism and Resources) | 240 | Public | Firm | All firms | Expansion, Maturity | Money (Tax concession) | Firm-level innovation | All | 125% tax deduction for eligible expenditure on private sector R&D to encourage development of innovative products, processes and services and to promote strategic R&D planning 175% tax reduction for new, additional R&D expenditure.. |
| Brazil | BR1 | | INOVAR Venture capital program | www.capitalderisco.gov.br | 2000 | Ongoing | FINEP, Brazilian research and projects financing agency | n/a | Mix public | Firm | High growth SMEs | Expansion | Networks | Capital (VC) | Technology | Access to venture capital. INOVAR PROJECT intends to build an institutional environment that helps nurture the activity of venture capital in the country in order to fortify the incipient and emerging Brazilian technology-based companies, contributing, ultimately, to the national technological progress and for to generate jobs and income.<br>The INOVAR Project includes:<br>· INOVAR Fund Incubator;<br>· Brazil Innovation Forum;<br>· Brazil Venture Capital website;<br>· INOVAR Business Prospecting and Development Network;<br>· Development of capacity building and training programs for venture capital agents. |

| Basic data | | Results and performance | | | | | | | | Lessons learned and comments |
|---|---|---|---|---|---|---|---|---|---|---|
| Country | Short name | Number of firms processed in total | Number of firms processed per year | Qualitative assessment | More entrepreneurial firms | Increased growth motivation | Improved growth success | Internationalization success | Performance data and evaluation | Lessons learned and comments |
| Australia | AU1 | a | n/a | Very successful | No | Yes | Possibly | No | Very highly regarded and more applicants than funds available. | Very effective for established companies, e.g. MarkII product. |
| Australia | AU2 | 300 | n/a | Very successful | Yes | Yes | Yes | No | Very favorably independently reviewed before continuation. | COMET provides access to an experienced case manger for the duration usually about 12 months. The shortage is of experienced people in so many specialist areas that a new growth venture needs access to over a longer period. |
| Australia | AU3 | 600 | n/a | Very successful | Yes | Yes | Yes | Possibly | Recent rigid and conservative review showed "Australian economy's overall performance has been considerably enhanced when compared to the performance that would have incurred in its absence". Very favorable independently reviewed before continuation. the | An outstanding program with a solid record of generating spin-offs with high survival ad growth rates. |
| Australia | AU4 | n/a | 3278 (2003/4) | Successful | No | Possibly | Yes | Yes | Present program based on several reviews of earlier programs. Users generally satisfied, but not always. | |
| Australia | AU5 | n/a | n/a | Successful | No | No | Yes | Yes | n/a | n/a |
| Australia | AU6 | 75 | n/a | Very successful | Possibly | Possibly | Yes | Possibly | Being evaluated at present. Government made a profit on its share of the investment. | Designed as early stage VC, but effectively middle/late stage VC due investor risk aversion. |
| Australia | AU7 | 95 investors in program | n/a | Successful | No | No | Possibly | No | n/a | Widely used to create effective partnerships to fund start-ups. |
| Australia | AU8 | 30 | n/a | n/a | Yes | Yes | Possibly | No | Only in early stage. Doubtful value. | Difficult to agree valuations at this early stage. Have to give away too much equity. Looking at alternatives to (diluting) equity at pre-seed stage; for example exclusive licensing rights |
| Australia | AU9 | 5503 | 5503 | Successful | Possibly | Possibly | Possibly | Possibly | €4 billion of R&D expenditure reported by the 5503 businesses in income year 2003-04 | n/a |
| Brazil | BR1 | 137 | 24 | Successful | No | No | Yes | No | 55 MEUR of VC funding for 22 firms received between 2000-04. See http://www.capitalderisco.gov.br/VCN_ING/en_resultados_PI.asp. 137 firms selected (6% of candidates) and presented for VC funding; 22 have received funding. The Brazilian Economic and Social Development Bank announced in August 2005 that it will stimulate creation of 7 new funds á 8MEUR that target technology innovation development in emerging firms | n/a |

| Basic data | | | | | | | | | Operational and focus data | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | Short name | Region | Program name | Web address | Year started | Ongoing / Long term / Short term | Principal institution | Total annual budget (MEUR) | Privately or publicly funded | Principal unit of analysis | High growth or SME focus | Firm life-cycle stage | Principal type of support by government | Firm resource bottleneck addressed | Industry or sector addressed | Description of support |
| Brazil | BR2 | | PAPPE - Program for Supporting Research in Enterprises | www.finep.gov.br/programas/pappe.asp (Portuguese) | 2004 | Ongoing | FINEP - the Financing Agency for Studies and Projects | 66 | Public | Entrepreneur | High growth SMEs | Early growth, Expansion | Money (Grant) | Firm-level innovation | Technology, Manufacturing | A program to provide research grants to individuals in small companies for new product development, similar to the Small Business Innovation Research Program (SBIR), existing in the U.S. |
| Brazil | BR3 | | PROGEX National program of technology support for export | www.cetec.br/progex/ | 2001 | Ongoing | MCT, Ministry of Science and Technology | 7.8 | Public | Firm | High growth SMEs | Expansion, Maturity | Money (Grant) | International market access | Manufacturing | "A federal government program established to stimulate Brazilian exports, especially by micro and small companies. The main point of the program is technological assistance to those who already export or who are on the way to export." Can e.g. help cover the cost of a technology consultant. Provides funding, management, skills, advice, training, prototyping, logistics, manufacturing support for exports and import substitution. To generate new exporting companies or to extend the capacity of that already in the international market, through the technological adequacy of its products to requirements of specific markets. |
| Finland | FI1 | | AISP - Strategy for the financing and service system of innovative start-up companies | n/a | 2005 | Long-term project | Ministry of trade and industry | 330 | Mix public | Firm | High growth SMEs | Seed, Start-up, Early growth, Expansion | Money (Grant, Equity) | Capital (VC) | All | Takes selected companies through a three-stage process of business-plan development, seed funding, post-seed funding and provides appropriate financing through separate funds for each stage. Utilizes both private and public capital for the financing. |
| Finland | FI2 | | Growth Firm Service | n/a | 2003 | Ongoing | Ministry of trade and industry | 0,5 for coordination | Public | Firm | High growth SMEs | Early growth, Expansion | Advice, Mentoring | Integrative, Business expertise | All | "One-touch shop" for public services relevant to growth firms such as finance and internationalization. Field consultants in 4 public institutions proactively identify promising growth firms and offer a growth analysis session to the firms; based on the growth analysis, specific needs for achieving growth are prioritized and appropriate services from the 4 participating institutions are referred to. |
| Finland | FI3 | | INTRO | www.presed.fi | 2002 | Ongoing | The Finnish National Fund for Research and Development (Sitra) | 1,2 MEUR for coordination, 1 MEUR for investments | Public | Firm | High growth SMEs | Seed, Start-up, Early growth | Networks | Capital (BA) | Knowledge-based | Aim is to support the investment readiness of early-stage and growth businesses by facilitating access to early financing rounds through networks and thereby support the formation of a private VC/BA market in Finland |
| Finland | FI4 | | Research into Business (TULI) | www.tuli.info | 2002 | Long-term project | Tekes, Tekel | 2,7 | Public | Entrepreneur | High growth SMEs | Seed | Money (Grant) | Business expertise | Technology | Aim is to promote the commercialization of research through licensing, creating of new firms and cooperation around new technologies. A grant of max 10,000€ is provided to cover the full costs for private sector experts' advice on issues related to commercialization (legal advice, market analysis, etc) of a research result. The research results and teams are identified by the universities' technology officers, who broker the grant to the teams. |
| Hong Kong | HK1 | | Applied Research Fund (ARF) | www.itc.gov.hk/en/welcome.htm | 1993 | Ongoing | Innovation Technology Commission, HK Government | n/a; thus far a loss of 25 MEUR | Public | Firm | High growth SMEs | Early growth, Expansion | Money (Equity) | Capital (VC) | Technology | Government-owned venture capital fund (originally 75 MEUR); investment decisions are made by qualified external venture capitalists (one of the VCs invested his own money in the fund) |
| Hong Kong | HK2 | | Hong Kong Applied Science and Technology Research Institute (ASTRI) | www.astri.org | 2001 | Ongoing | Innovation Technology Commission, HK Government | 9,5 | Public | Sector | All firms | Seed, Maturity | Money (Subsidy) | Firm-level innovation | Technology | Perform R&D for transfer to industry for commercialization with a view to elevating the technological level of industry and stimulating the growth of technology-based industry in Hong Kong. ASTRI has five specific research areas: photonic technologies, integrated circuit design, Internet software, wireless communications and biotechnology. Bring together companies in select industries to cooperate around commercializing technologies; churn out intellectual property that can be licensed. |
| Hong Kong | HK3 | | Hong Kong Science & Technology Parks (HKSTP) | www.hkstp.org | 2000 | Ongoing | HK government | 4 | Public | Firm | High growth SMEs | Early growth, Expansion, Maturity | Infrastructure | Infrastructure, Networks | Technology | Science park and incubation facilities. Offer consultancy, management and marketing services to tenants |
| Hong Kong | HK4 | | Small Enterprise Research Assistance Program (SERAP) | www.itf.gov.hk/eng/SERAP.asp | 2000 | Ongoing | Innovation Technology Commission, HK Government | n/a (approx 50-100 MEUR invested annually) | Public | Firm | High growth SMEs | Seed, Start-up | Money (Loan) | Firm-level innovation | All | Small part of the innovation & technology fund (ITF), aiming to support projects that contribute to innovation and technology upgrading in industry. Provides an interest-free loan of up to €200k on a dollar-for-dollar matching basis (the matching can be in terms of manpower); funding given in two phases: prototyping and second phase. Applications to SERAP is reviewed by an assessor panel from industry and academia. SERAP is managed by the HK innovation technology commission. |
| Hungary | HU1 | | Corvinus International Investment | www.corvinusen.sitesset.hu | 1997 | Long-term project | Hungarian Development Bank | 6,8 | Public | Firm | High growth SMEs | Early growth, Expansion, Maturity | Money (Equity) | Capital (VC) | Technology | Co-invests with SMEs for international expansion and improvement of competitiveness; the SMEs must have a registered patent. Planned duration is up to 10 years |

| Basic data | | Results and performance | | | | | | | | Lessons learned and comments |
|---|---|---|---|---|---|---|---|---|---|---|
| Country | Short name | Number of firms processed in total | Number of firms processed per year | Qualitative assessment | More entrepreneurial firms | Increased growth motivation | Improved growth success | Internationalization success | Performance data and evaluation | Lessons learned and comments |
| Brazil | BR2 | 537 (since 2004) | the program execution is regional | Successful | No | Yes | Yes | No | n/a | The building of relationship networks is seen as crucial. 20 of 27 states are involved in the program. Besides fostering the interaction between researchers and high-tech based firms for developing innovative projects, it is expected that PAPPE will contribute for the convergence and consolidation of the local and national innovation systems. |
| Brazil | BR3 | 270 | 141 | Successful | No | Yes | Yes | Yes | n/a | The attendance-office spread in different country regions is essential to reach the proposal objectives. |
| Finland | FI1 | n/a | 300 | n/a | Possibly | Possibly | Possibly | No | n/a | AISP attempts to cover the multi-year process as a whole from start-up to expansion through the many stages of the program. Feedback: too many participants and interfaces |
| Finland | FI2 | 300 | 300 | Successful | No | Possibly | Yes | Yes | n/a | Coordination of 4 strong organizations is difficult since each has a mind of its own and somewhat different objectives; the skill of the field agents vary a lot, and the success of the program is largely dependent on the field agents. The coordination program can be recommended in countries where many different organizations offer services to growth firms |
| Finland | FI3 | 150 | 40 processed; 14 have received financing | Very successful | No | No | Yes | Possibly | 5 companies have received over 10MEUR in subsequent private financing rounds | Business angels are not home biased. Time-to-market is critical in many sectors, and the measures therefore need to be quick and flexible. Training is required for both entrepreneurs and business angels on early-stage financing and valuation; at INTRO these two groups attend the same training session to build a joint understanding. It's not only enough that firms get some financing; firms need enough financing to realistically enable growth in their markets; €350k is the average investment in INTRO companies. Business skills and experience is highly important, and business angels and experienced business professionals have much to contribute to young entrepreneurial firms in terms of business knowledge. 40 companies are chosen annually for the program; in Finland, that represents largely all the high-growth potential firms. 300 business angels are involved, and their total "disposable" capital is 40MEUR. Money by private investors is typically supplemented with research grants and capital loans e.g. from Tekes (for a total up to 50% of the total investment), bringing the typical total available financing up to around 1MEUR |
| Finland | FI4 | 1201 (supported), 2299 (evaluated) | 389 (supported), 670 (evaluated) | Successful | Yes | Possibly | No | No | 112 firms have been started and over 70 technologies have been licensed | It has been important the program is quick, flexible and non-bureaucratic. Private sector experts provide the services (brokered by Tekel); while Tekes finances. However, there is still a gap behind TULI from the making the commercialization plan of the research result to actually bringing a novel product or service to market. Another problem has been to find knowledgeable private-sector consultants that are able to support the researchers |
| Hong Kong | HK1 | 25 after 1998 | 3 or 4 | Not successful | No | No | Possibly | No | Fund has so far lost 25 MEUR (of which 10 MEUR is realized); of 50 projects, 32 have showed a loss and 18 no loss | Judged to be a failure. Differences between public and private sector mentality seems to hinder successful public VC funds. E.g. investees were of a lower quality on average than those financed by private sector VCs |
| Hong Kong | HK2 | n/a | n/a (250 researchers, expected to grow to 800 within a few years) | Successful | Possibly | No | Possibly | No | 15 technology licenses to industry under new management model (target is 100+ per year) | Used to incubate and spin off start-ups, but changed focus to be a R&D cooperation institute for industry participants in order not to compete with the current firms with new start-ups (copied model from ITRI in Taiwan). Cooperation with university did not work well since the research focus (applied vs. basic) was different. |
| Hong Kong | HK3 | n/a | 216 tenants and 90 incubatees currently in program | Successful | Yes | No | Yes | No | Some success stories; see http://www.hkstp.org/english/incubation/inc_success/inc_success.html; about 10-15% of graduated companies are doing quite well; three companies have been listed on Growth Exchange Market so far | All services must be charged for or they will be abused. Monitoring of incubatees is necessary to ensure the continued performance of the companies |
| Hong Kong | HK4 | 226 | 50 (out of 120 applications) | Somewhat successful | Yes | No | Possibly | No | Several SERAP companies have obtained follow-on investments. Not yet a success in monetary terms (progress is slow), but scheme is judged to be continued and expanded | It is difficult to judge the performance of funding schemes within only a few years |
| Hungary | HU1 | 50 | 8-10 supported firms p/a planned | Very successful | No | Yes | Yes | Yes | No data yet; 30-40% growth rate for companies is expected | n/a |

| Basic data | | | | | | | | | Operational and focus data | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | Short name | Region | Program name | Web address | Year started | Ongoing / Long term / Short term | Principal institution | Total annual budget (MEUR) | Privately or publicly funded | Principal unit of analysis | High growth or SME focus | Firm life-cycle stage | Principal type of support by government | Firm resource bottleneck addressed | Industry or sector addressed | Description of support |
| Hungary | HU2 | | Development of the technical and technological background of SMEs - ECOP 2.1.1 | www.gvop.gov.hu | 2004 | Long-term project | Ministry of economy and transport | 43,2 | Public | Firm | All firms | All | Money (Subsidy) | Technological expertise | All | Subsidies for firms to invest in technical equipment and technology |
| Hungary | HU3 | | For the prosperous Hungary enterprise development credit program | www.mfb.hu/index.php?pageid=510 | 2005 | Long-term project | Hungarian Development Bank | 200 | Public | Firm | All SMEs | Expansion | Money (Loan) | Capital (Debt) | All | Financing between 20kEUR and 3,5MEUR. Maximum of 75% of the investment. Interest is euribor+1-4% risk premium. Achieved by the development bank lending to partner banks at favorable interest rates that in turn lend to SMEs. Program focuses especially on the "local SME sector". |
| Hungary | HU4 | | Information Technology Venture Capital Fund Manager | www.rfh-rt.hu | 2002 | Long-term project | Regional Development Holding | 10,7 | Public | Firm | High growth SMEs | Start-up, Early growth | Money (Equity) | Capital (VC) | ICT | VC fund for ICT companies. The fund is profit-oriented and invests in companies with a high potential for growth |
| Hungary | HU5 | | KVFP Venture capital investment | www.kvfp.hu | 2002 | Long-term project | Ministry of economy and transport | 12,5 | Public | Firm | All SMEs | Expansion | Money (Equity) | Capital (VC) | All | Financing in equity (up to 49% of total equity) with investment horizon of 3-5 years in SMEs with "good management and significant growth potential". Buy-back of the stake is mandatory at the end of the investment period. Does not take part in the management of the firms. Seeks positive returns although it is "only moderately profit-oriented". Does not invest in ventures that can be financed by traditional banking products such as real estate and working capital. |
| Hungary | HU6 | | SME development capital program | www.mfb.hu/index.php?pageid=206 | 2003 | Long-term project | Hungarian Development Bank | 35 | Public | Firm | All SMEs | Expansion | Money (Capital Loan) | Capital (VC) | All | Financing between 0,2-2MEUR with investment horizon of 1-5 years for established SMEs with good track record. Maximum financing share is 49%. Risk premium on interest is 6%. For all SMEs, i.e. not only high growth |
| Hungary | HU7 | | Support of Access to Advanced Level Consultancy Services - ECOP 2.2.2 | www.gvop.gov.hu | 2004 | Long-term project | Ministry of economy and transport | 0,65 | Public | Firm | All firms | Expansion, Maturity | Money (Subsidy) | Business expertise | All | Subsidies to firms for consulting and expert services |
| Hungary | HU8 | | VIVACE program of the Hungary Patent Office | www.hpo.hu/English | 2004 | Long-term project | Hungarian Patent Office; funded by the government | 0,419 | Public | Firm | All SMEs | All | Money (Subsidy) | IPR | Technology | Subsidy for mentoring, advice and experience sharing on patenting for SMEs by IP experts; also patent telephone help-line, education schemes for attorneys, and promotional activities |
| Italy | IT1 | | BIC (Business Innovation Centres) | www.bic-italia.net | 1984 | Ongoing | Various regional and provincial institutions | n/a | Public | Firm | All SMEs | Start-up, Early growth | Advice, Mentoring | Business expertise | Technology | Regional innovation centers that mainly provide advice and support to new business for business plans, and provides consulting services related to management, marketing, and legal issues. "BICs act as an interface between the needs of SMEs and the specialist services on offer. SMEs can in this way benefit from a preliminary overall diagnosis of their actual requirements before applying for such services.." |
| Italy | IT2 | Piedmont | I3P (Incubator of the Turin Politecnico) | www.i3p.it | 1999 | Ongoing | Politecnico di Torino; financing divided between 6 partner institutions | n/a | Public | Firm | High growth SMEs | Start-up, Early growth | Infrastructure | Infrastructure | Knowledge-based | Incubator linked to the Torino Politecnico (targeted at students, recent graduates and employees of the university) for knowledge-based start-ups. Firms can stay in the incubator for up to 3 years. Has a high degree of selection for incoming firms. Also organizes a "Start Cup" provides seed capital through affiliated seed fund. |
| Italy | IT3 | Liguria | Incubatore Tecnologico Genova | www.incubatoretecnologico-ge.it | 2002 | Ongoing | Comune di Genova | 2,2 | Public | Firm | High growth SMEs | Start-up, Early growth | Infrastructure | Infrastructure | Technology | Incubator linked to the University in Genoa providing office space and consultancy/mentoring services to support new entrepreneurs and firms (firms can stay up to a maximum of 3 years). Also can provide a small grant (13kEUR) and a zero-interest loan for co-financing up to 70% for investments |
| Italy | IT4 | Piedmont | Piemontech VC fund | www.piemontech.it | 2004 | Ongoing | Fondazione Torino Wireless | 2,5 | Mix public | Firm | High growth SMEs | Start-up, Early growth | Money (Equity) | Capital (VC) | Technology | Small venture capital fund operated by a publicly founded foundation, investing from 20kEUR to 200kEUR for a 20-35% equity stake in start-up companies in Piedmont. Firms must have a high growth potential and aim at international markets. Also provides advice and consulting support. |
| Italy | IT5 | Southern Italy | Southern Italy High-tech Fund | www.mininnovazione.it | 2005 | Ongoing | Ministero per l'Innovazione e le Tecnologie | 100 | Mix equal | Firm | High growth SMEs | Start-up, Early growth, Expansion | Money (Equity) | Capital (VC) | Technology | Governmental scheme to co-invest up to 50% in VC funds that invest in Southern Italy or up to 33% in general funds. Leaves management of the portfolio companies to the VC funds. The maximum duration of the investment in each fund is 10 years plus a maximum 3 years needed for divestment. Applying funds are chosen on criteria such as their consistency, professionalism, etc. Funds specialized in spin-offs and early stage financing are prioritized. |
| Netherlands | NL1 | | Mastering Growth Programme | n/a | 2006 | Long-term project | Ministry of Economic Affairs | 0,25 | Public | Entrepreneur | High growth SMEs | Early growth, Expansion, Maturity | Training, networks | Integrative | Other sectors | Highly interactive masterclasses in which the (potential) fast growing companies learn from each other (advice, case studies, experience sharing) about achieving high growth, funding, human resource management, strategies, etc. Four different modules targeting firms of different sizes: start-ups, mid-sized, large firms |
| Netherlands | NL2 | | TechnoPartner Programme | www.technopartner.nl | 2004 | Long-term project | Ministry of Economic Affairs (joint initiative of The Ministry of Economic Affairs and The Ministry of Education, Culture and Science) | 85 | Public | Firm | High growth SMEs | Start-up, Early growth | Money (Loan, Guarantee), Networks, Advice | Capital (VC, BA) | Technology | Consists of 4 subprograms: Knowledge Exploitation funding programme (for research commercialization; entrepreneur screening and scouting, help with patents, pre-seed financing); Seed facility (improves risk-return for private investors through a subsidized loan for co-investment); Certificate (reduces risk for banks financing high-growth SMEs through a loan guarantee of 80% up to 100kEUR if firms pass a certification by the programme for its business outlook); Business Angel Programme (information service for "virgin angels"). Participating firms cannot be older than 5 years and must fall under EU's SME definition. "TechnoPartner wants to improve the growth climate by: * giving techno starters access to capital, knowledge, experience and equipment, * a platform where techno starters can put questions, ideas and comments; * motivating knowledge institutes and investors to offer their money and knowledge to pioneers." |
| Spain | ES1 | Madrid | Contest of Ideas for the Creation of Technological or Scientific-based Industries | http://parquecientifico.uc3m.es/emprende/ | 2004 | Ongoing | University Carlos III and Technological Park of Leganés | n/a | Public | Entrepreneur | High growth SMEs | Seed | Money (Grant) | Firm-level innovation | Technology | Contest for new technology- or science-based business ideas. Also provides free access to incubator for 6 months to winners as well as advice and support. |

| Basic data | | Results and performance | | | | | | | | Lessons learned and comments |
|---|---|---|---|---|---|---|---|---|---|---|
| Country | Short name | Number of firms processed in total | Number of firms processed per year | Qualitative assessment | More entrepreneurial firms | Increased growth motivation | Improved growth success | Internationalization success | Performance data and evaluation | Lessons learned and comments |
| Hungary | HU2 | 9139 firms applied and 3027 received support in 2004 and 2005. No decision yet for 2006 | 1337 supported in 2005 | Successful | No | Possibly | Possibly | Possibly | Several success stories of firms that have been able to grow after receiving support from the fund (Luk Savaria Kft - supplies Audi, Opel, Suzuki with clutches) | Not specifically for high-growth firms, but many high-growth firms have still benefited |
| Hungary | HU3 | 2500 | 1000 | Successful | No | No | Possibly | No | No performance data available. Deemed to fill a gap by providing credit to SMEs that otherwise would not be able to obtain them. | n/a |
| Hungary | HU4 | 40 applicants, 8 supported in 2004 and 2005 total | 4 supported in 2005 | Very successful | Yes | Yes | Yes | Possibly | Success story: Stormregion Ltd (a game software development firm) | n/a |
| Hungary | HU5 | 33 | 10 | Successful | No | No | Yes | No | 28 open investments, 5 closed. Average investment has been 200kEUR. No performance data for the measure is available. An exit realized in ALUKOL Kft in 2006 | n/a |
| Hungary | HU6 | n/a | n/a | Successful | No | No | Possibly | No | No performance data available. Deemed to fill a gap by providing credit to SMEs that otherwise would not be able to obtain them. | n/a |
| Hungary | HU7 | 1139 firms have applied in 2004 and 2005 of which 634 supported | 664 applied in 2005 of which 415 supported | Successful | No | Possibly | Possibly | No | n/a | n/a |
| Hungary | HU8 | 1500 | 500 | Successful | No | Yes | Possibly | Possibly | Has improved the patenting rate by SMEs. The direct influence on growth is difficult to measure. | The Hungarian patent activity has fallen back since 1980s, but now with this new support system it stopped decreasing and turned upward the tendency. |
| Italy | IT1 | 876 (as of 2001) | 431 (as of 2001) | Not successful | Possibly | Possibly | Possibly | No | Not much monitoring has been performed on the measure; latest evaluation carried out in 2001. Interviewee stated that the BICs in Italy "work well". | No common logic is shared between the BICs in Italy, and the measure seems to be a question mark |
| Italy | IT2 | 69 firms have been in the incubator | 36 firms current in the incubator, plus 18 pre-incubator ideas that are offered training courses | Successful | Yes | Possibly | Yes | No | 50 firms created in 2000-05, 220 new jobs and total turnover of 8MEUR per year. Low mortality rate (out of 50 firms created in 2000-05 only four have gone out of business). Received the 2004 "Best Science Based Incubator Award" by Science Alliance. | Key strengths have been the closeness to the university and the high selectivity which has resulted in higher success rates |
| Italy | IT3 | 17 incubated out of 30 applicants | 15 firms currently in incubator | Somewhat successful | Yes | No | Possibly | No | After a slow start, the incubator has started to attract a somewhat growing interest among firms. TechnoAware is a success story. | Accepting year-round applications has worked better than setting a yearly application deadline. A downside is that it is located quite far from the university. The incubator has a high acceptance rate (over 50%), probably explained by the fact that the parent institutions are public |
| Italy | IT4 | 12 investments out of 600 proposals; the goal is to invest in 40-50 firms in total | 12 current investments | Successful | Yes | Yes | Yes | No | 6 out of 8 first firms funded are generating revenues, none have gone out of business. No divestments for the fund, but some negotiations about second-round financing. | Entrepreneurs are increasingly becoming aware about VC funding and prepared for the demands of institutional investors. Compared to other public support measures, the fund can be very strict in the selection of applicants |
| Italy | IT5 | n/a | n/a | n/a | No | No | Possibly | No | Too early to evaluate since there have yet been no investments made. Nevertheless, the fund has attracted some attention from VC firms through their national association (AIFI) | n/a |
| Netherlands | NL1 | Expected: 10-15 participating firms | n/a | Very successful | No | No | Possibly | No | n/a | n/a |
| Netherlands | NL2 | n/a | In 2005: 7 VC funds (out of 14 applicants) supported; 7 research ideas sponsored; 23 firms certified | Very successful | No | No | Yes | No | n/a | n/a |
| Spain | ES1 | 12 projects so far promoted | 3 projects promoted | Very successful | Yes | Yes | No | No | Some new firms created; limited data on their successfulness | Important measure in a country where few young people are interested in an entrepreneurial career |

| Basic data | | | | | | | | | Operational and focus data | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | Short name | Region | Program name | Web address | Year started | Ongoing / Long term / Short term | Principal institution | Total annual budget (MEUR) | Privately or publicly funded | Principal unit of analysis | High growth or SME focus | Firm life-cycle stage | Principal type of support by government | Firm resource bottleneck addressed | Industry or sector addressed | Description of support |
| Spain | ES2 | University Miguel Hernandez | Embryo Project - Programme for University Entrepreneurs | observatorio.umh.es/embryo | 2000 | Ongoing | Universidad Miguel Hernandez de Elche (Financed mainly by the European Commission) | n/a | Public | Entrepreneur | High growth SMEs | Seed | Training, networks | Integrative | Technology | The EMBRYO project is focused on the identification of entrepreneurs (with university backgrounds), promotion and development of their entrepreneurial skills, and also the development of a local expert infrastructure in order to give support to the needs of technology-based ventures. EMBRYO embraces all the different phases of entrepreneurship from opportunity identification and motivation to issues of monitoring and control once the firm has been set up. The university provides the infrastructure needed to develop and coordinate the Embryo firm. Offers courses and counseling in business topics for researchers. |
| Spain | ES3 | Cantabria | Emprecan (Programa Emprendedores de Cantabria) | www.emprecan.cantabria.org | 1999 | Ongoing | SODERCAN (a public enterprise by Cantabria's government, Caja Cantabria, and the Commerce Chamber of Cantabria) | n/a | Public | Entrepreneur | All SMES | Seed, Start-up | Money (Grant, Subsidy) | Business expertise | Technology | Funding and training for young people to start firms. Can provide financial support for the firms of up to 100% (for tutoring and experts), 70% (viability studies), and subsidize investments. |
| Spain | ES4 | Catalonia | Prestecs Participatius del CIDEM - Participative loans | www.cidem.com/cidem/cat/actualitat/noticies/2006/03/306prstecscapitalconcepte.jsp | 2006 | Ongoing | Invertec (a seed fund created by a group of universities) | 2,6 | Public | Firm | High growth SMEs | Seed, Start-up, Early growth | Money (Grant, Equity) | Capital (VC) | Technology | 2 types of financing for the start-up and growth of technological-based firms. Concept capital of up to 100kEUR as a subsidized participative loan; Seed capital of up to 300kEUR as an equity stake in the firms to accelerate growth during the initial stages. |
| Spain | ES5 | | Red de Pymes Innovadoras (Innovative SME Network) | www.banespyme.org | 2005 | Ongoing | Banesto / Banespyme School of the Banesto Cultural Foundation | n/a | Mix private | Environment | High growth SMEs | All | Networks, Advice | Integrative | Technology | A part of a project by Banesto to spur growth in firms. Encourages networking between SMEs through the web; creates publications and TV programs on growth and digitalization. |
| UK | UK1 | South East | Enterprise Hub | www.webhub.co.uk | 2001 | Ongoing | South East England Development Agency (SEEDA) | 2,5 | Public | Firm | All SMEs | Start-up, Early growth | Advice, Mentoring | Integrative, Business expertise | Technology | Form local hubs where support is provided by a hub director to start-ups over a period of 2-3 years, e.g. to encourage cooperation and promote the business locally. Support is in the form of feasibility evaluations, trademark support, incubators, research help |
| UK | UK2 | London | Gateway2Investment (g2i) | www.g2i.org | 2005 | Long-term project | Grant Thornton is lead delivery partner. London Development Agency is principal financier. All 42 London Universities participate | 0,6 | Mix public | Firm | High growth SMEs | Start-up, Early growth | Training | Capital (VC, BA) | Technology | Help and assistance to innovative firms to become investment-ready. No grants are given; support is provided through individual and group workshop sessions, information, self assessment, diagnostic and support tools (e.g. the software Gauntlet) |
| UK | UK3 | Wales | High Growth Programme | www.entrepreneuraction.co.uk | 2005 | Long-term project | Welsh Assembly Government's Department for Enterprise, Innovation and Networks. Co-financed with the EU | 3,66 | Public | Firm | High growth SMEs | Seed, Start-up, Early growth | Mentoring, Money (Subsidy) | Integrative, Business expertise | All | Program is for nascent entrepreneurs or young firms (started within 12 months) that have a goal to reach 1MGBP turnover organically within three years. Offers mentoring support and facilitates contacts to private-sector experts for firms accepted into the program. Offers these firms a total of 180h of mentoring support, and 140h of specialist support and management/specialist workshops. Mentors and advisors have management experience. |
| UK | UK4 | South Yorkshire | High Growth Start-up | www.yorkshire-forward.com | 2001 | Long-term project | Business Link South Yorkshire. Co-financed between the EU and Yorkshire Forward Development Agency | 2,5 | Public | Firm | All SMEs | Start-up, Early growth | Money (Subsidy) | Integrative, Business expertise | Technology, Professional Services | A mentor will assist making a diagnostic and action plan and broker appropriate support for the business. The mentors are experienced private-sector entrepreneurs. Aim is to make South Yorkshire the best place to start and grow a business in the UK. |
| UK | UK5 | East Midlands | High-growth company support programme | n/a | 2006 | Short-term project | PERA | 0,53 | Public | Firm | All SMEs | Maturity | Advice, Mentoring | Integrative, Business expertise | All | Business coaching for established SMEs (sales 3-10MGBP) in the region that have a growth potential of 20% p.a. over 5 years; providing a company health check , advice, and links to other support measures. In the pilot, 17 companies have been selected out of 84 applicants. |
| UK | UK6 | West Midlands | Mustard.uk.com | www.mustard.uk.com | 2000 | Ongoing | Advantage West Midlands and European Regional Development Fund are principal financiers. Co-financed with the EU | 2,64 | Public | Entrepreneur | High growth SMEs | Seed, Start-up | Money (Subsidy) | Integrative, Business expertise | All | Refers firms to and subsidizes private consultancy services (management consulting, law, accounting, etc) for new potential entrepreneurs and start-up firms that have a target of at least 250kGBP turnover in their second year and are willing to locate in the region. No grants are provided. |
| UK | UK7 | West Yorkshire | West Yorkshire Ventures | www.wyventures.co.uk | 2005 | Long-term project | West Yorkshire Enterprise Partnership | 1,78 | Public | Firm | High growth SMEs | Start-up, Early growth | Money (Subsidy) | Integrative, Business expertise | All | Financial support for professional services up to 12 months and advice support up to 24 months for participating firms in the region. Firms must target a turnover over >1MGBP within three years. Level of funding for the services depends on likely level of growth and the type of activities to be undertaken. |

| Basic data | | Results and performance | | | | | | | | Lessons learned and comments |
|---|---|---|---|---|---|---|---|---|---|---|
| Country | Short name | Number of firms processed in total | Number of firms processed per year | Qualitative assessment | More entrepreneurial firms | Increased growth motivation | Improved growth success | Internationalization success | Performance data and evaluation | Lessons learned and comments |
| Spain | ES2 | 74 start-ups, 4-spinoff; 218 business projects/ideas | 14 start-ups, 1 spin-off | Very successful | Yes | Possibly | Possibly | No | 150 new jobs in the start-up firms. 7412 students enrolled in the "entrepreneur's club". 1068 participants in motivation and training activities. Example company: NutraCitrus | Important to gain the acceptance of the university board to develop the program to suit the needs of the entrepreneurs and network partners |
| Spain | ES3 | n/a | n/a | Successful | Possibly | Possibly | Possibly | No | Limited data available for the measure. Represents a good example of cooperation between universities, government agencies, entrepreneurs and firms. | n/a |
| Spain | ES4 | 3 so far, 26 expected for full year 2006 | n/a | Very successful | Possibly | Possibly | Possibly | No | Represents a good example of cooperation between universities, government agencies and entrepreneurs. Success story: Activery biotech | n/a |
| Spain | ES5 | n/a | n/a | Somewhat successful | No | Possibly | Possibly | No | Example of one network where innovative SMEs interchange ideas and experiences | n/a |
| UK | UK1 | n/a | 300 | Successful | No | Possibly | Yes | No | 12MGBP of investments was made in the firms last year | The people involved in the business hubs are most important for the successfulness of the hubs. Important to involve partnerships with local businesses, universities and institutions |
| UK | UK2 | 169 companies have received 2h or more support; a smaller number has received more intensive support | n/a | Very successful | No | No | Yes | Possibly | 13 companies in the program have together raised 6MGBP (between 0,1-1MGBP per firm). Firms have created 117 new jobs. The target is to raise 30MGBP by 2008. | Lack of financing is not a problem in London, but instead the knowledge and skills about how to access the finance is the bottleneck. The program thus acts as a gateway for firms to access financing. London has a lot of capital to be invested. Manage customer expectations among the firms; make sure the program is ready and robust before launch |
| UK | UK3 | 270 (planned, over three year period) | 90 | n/a | No | Possibly | Possibly | No | Several businesses already near 1MGBP turnover in their first year in the program. 5 out of 38 clients have received VC investments, 4 additional firms are in discussions with VCs | n/a |
| UK | UK4 | 595 | 150 | Very successful | No | Possibly | Yes | No | 2010 jobs created in 595 business starts | Important that the mentors have private-sector experience from entrepreneurial activities. Entrepreneurs need to be shielded from data collection requirements and bureaucracy. |
| UK | UK5 | 17 (out of 84 applicant firms) | 17 | n/a | No | Possibly | Yes | No | The target of the pilot is to increase sales of the firms by approx 32MGBP (i.e. 2MGBP) per firm to 2008 | The importance of matching the coach to the business; the personality testing and matching is very time consuming. The company's specific barriers to growth and problem areas have been addressed first to gain trust instead of improving core business capabilities that was originally planned to be addressed first. |
| UK | UK6 | 2000 | 300 | Very successful | Possibly | Possibly | Possibly | No | The average size of companies that have participated in the program is 400kGBP turnover and 8 employees; some star companies have grown to over 100 employees | Important to involve respected private-sector partners since the target audience had a negative perception of government start-up support programs. Important that services are not free to the firms but only subsidized - this challenges and motivates clients. Quality assurance of private service providers. Important to tailor the services and the solutions for each company. |
| UK | UK7 | 566 | 140 | Very successful | No | Possibly | Yes | No | 566 businesses and 920 jobs created | Need to be flexible to adapt to the varying needs of high-growth entrepreneurs, need to understand entrepreneur's dislike of bureaucracy, manage intermediaries to achieve a flow of high caliber clients, ensure the use of competent advisors that can build credibility with clients |